REPORT

OF THE

MINISTER OF AGRICULTURE

FOR THE

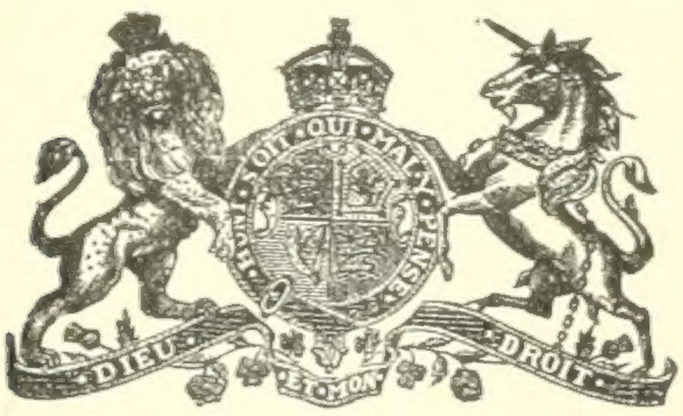
DOMINION OF CANADA

FOR THE

YEAR ENDED OCTOBER 31

1904

PRINTED BY ORDER OF PARLIAMENT



OTTAWA

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1905

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REPORT

OF THE

MINISTER OF AGRICULTURE

1904

To His Excellency the Right Honourable Sir ALBERT HENRY GEORGE, EARL GREY, *Viscount Howick, Baron Grey of Howick, in the County of Northumberland, in the Peerage of the United Kingdom, and a Baronet; Knight Grand Cross of the Most Distinguished Order of Saint Michael and Saint George, &c., &c., Governor General of Canada.*

MAY IT PLEASE YOUR EXCELLENCY—

I have the honour to submit to Your Excellency the annual report of the Department of Agriculture, for the year ended October 31, 1904.

I.—GENERAL REMARKS.

A synopsis of the work of the department and of the operations of the various branches comprised therein is laid before Your Excellency. The work in each has been efficiently carried out.

The legislation affecting the department during the last session of Parliament consisted of Chapter 6, 4 Edward VII., intituled 'An Act to amend the Animal Contagious Diseases Act, 1903.'

This action was taken for the following purposes:—

To add to the list of infectious or contagious diseases mentioned in sub-section *e* of section 2 of 'The Animal Contagious Diseases Act, 1903,' the disease of Maladie du Coit;

To grant compensation for animals slaughtered owing to their being affected or in contact with infectious or contagious diseases, and

To limit the valuation per head of grade animals and pure bred animals so slaughtered.

By Proclamation under date the 8th January, 1904, the port of Louisburg, N.S., was declared a Quarantine Station. Vide *Canada Gazette,* vol. xxxvii, page 1254.

By Order in Council approved by Your Excellency under date the 23rd February, 1904, revised and amended Rules and Forms of the Canadian Patent Office were established. Vide *Canada Gazette,* vol. xxxvii, page 1798.

By Order in Council approved by Your Excellency under date the 30th March last, in virtue of the provisions of 'The Animal Contagious Diseases Act', the Order in Council dated the 25th January, 1897, establishing regulations relating to Animals' Quarantine and Health of Animals was rescinded and new regulations substituted therefore. Vide *Canada Gazette,* vol. xxxvii, page 1967.

By Order in Council approved by Your Excellency under date the 30th March last, under the provision of section 5 of 'The San José Scale Act' the Order in Council of the 15th January, 1903, was amended. Vide *Canada Gazette,* vol. xxxvii, page 1970.

By Order in Council approved by Your Excellency under date 27th June last, in virtue of the provisions of Section 29 of 'The Animal Contagious Diseases Act', regulations were established relating to the disease of Mange in animals in the Dominion.

By Order in Council approved by Your Excellency under date the 8th July, 1904, in virtue of the provisions of Section 29 of 'The Animal Contagious Diseases Act', regulations were established relating to the disease of Maladie du Coit in animals.

By Order in Council approved by Your Excellency under date the 13th August, 1904, a change was made in the site of the Cattle Quarantine Reservation west of the 3rd Meridian, in the North-west Territories. Vide *Canada Gazette,* vol. xxxviii, page 469.

By Orders in Council under date the 19th September, 1904, in virtue of the provisions of Section 29 of 'The Animal Contagious Diseases Act', regulations were established authorizing the payment of compensation for animals slaughtered owing to the diseases of Maladie du Coit and glanders. Vide *Canada Gazette,* vol. xxxviii, page 624.

By Order in Council approved by Your Excellency under date the 19th September, 1904, under the provisions of Section 5 of 'The San José Scale Act', the Order in Council of the 5th January, 1901, was amended. Vide *Canada Gazette,* vol. xxxviii, page 574.

This year has been marked by our participation in the World's Fair known as the Louisiana Purchase Exposition, being held at St. Louis, in the United States, opening on May 1 last, and closing on December 1 next.

Our hopes of advantage to Canada through taking part in this exhibition have been fully justified. The decision to participate was come to because it was believed that we could thereby attract the attention of the agricultural and industrial classes of the great Mississippi valley to our Dominion as a field for emigration. To this end we have attempted to make an attractive and instructive display of our agricultural wealth especially, to prove that Canada was not an inhospitable country. We have

also attempted to show the mineral wealth of the country in such a way as to attract the attention of capitalists interested in mining. In both these attempts we have succeeded in a marked degree.

When the exhibition opened, I am happy to say that Canada's preparations were the most forward of any of the foreign exhibitors, and we were able to immediately attract the attention of visitors.

The exhibition was so organized that we were obliged to show our agricultural exhibits in the agricultural building, our horticultural exhibits in the horticultural building, our mineral exhibits in the mining and mineralogical building, and our forestry and game exhibits in the building devoted to those classes.

For convenience of management and for giving information to the visitors we found it necessary to have also a Canadian pavilion, where our officers could meet the public and have a supply of literature and information at hand. The exhibition authorities yielded to our insistence and gave us a site for this building in a most favourable locality, where those specially interested in agriculture and the public at large have found it easy to visit our building. This concession was a great advantage, as the other foreign pavilions and the various state buildings were not so well placed as ours.

Each and every one of our various exhibits is most successful, and reflects great credit on my chief commissioner, Mr. Hutchison, and the officers under him who collected them and installed them.

The agricultural, horticultural, and forestry and game exhibits are managed very much on the lines of the same classes of exhibits on other occasions, except that they are even more conspicuous and successful, but in the mineral exhibit we have adopted a new course. In addition to having what I might call good geological specimens of all the mineral productions of the country, arranged scientifically, we have endeavoured to make a striking display of certain mineral products for which the world is largely dependent on Canada, and of which we have an abundant commercial supply. These are presented in striking quantities and in a manner to attract special attention. Our gold exhibit is arranged so as to be most effective, especially from the fact that we have really tens of thousands of dollars' worth of the precious metal actually on exhibition, while the other supposed exhibits of gold in the building were nearly, if not all, imitation. This struck the imagination and impressed the visitors very much. The exhibits of asbestos, mica, nickel and corundum were all most attractive and most effective. An immense pyramid of solid specimens of cobalt-silver-arsenic ore also attracted great attention from both scientific geologists and the practical miner, as this ore had never before been seen in large specimens.

The general arrangement of the mineral exhibit, with the striking specimens in regard to Canada's production of certain of these in commercial quantities, is most effective, and compliments are being freely paid by both scientists and practical mining men as well as officers of the United States and other governments who are themselves actively engaged with the exhibits of those countries. Without making any in-

vidious distinction I venture to say that no mineral display superior to this has ever been made at a world's fair.

The other exhibits of Canada are all most excellent. Our agricultural products, with labels on them showing truthfully that they were grown in some instances as much as two thousand miles north of St. Louis, astonished the visitors. The horticultural display of most excellent fruits of all kinds not tropical or semitropical also show the attractiveness of our country for settlement and immensely impressed the visitors, especially those from the southern parts of the United States, who had always been told that Canada was an arctic region. Our display of furs and fur-bearing animals, with the exhibit of live beavers, is a constant attraction to every body and causes many inquiries amongst sportsmen as to the possibilities of a visit to Canada.

When the visitor is thus attracted by the exhibits he is easily led to a visit to the Canadian pavilion, and there the genial courtesy of our commissioner and staff, and the constant willingness to give all information about Canada, surprise and please him. The Canadian building is constantly crowded by the visitors, eagerly asking questions and demanding pamphlets and documents which they could read at their leisure. The building itself is full of illustrations of Canadian life, and the Canadian country, a most telling object lesson to the visitors. On the walls are to be seen a series of really artistic paintings depicting the development of prairie homes, from the first breaking of the sod to the later comfortable homestead, sheltered by trees and surrounded by stock. These are reproductions of scenes actually in existence in the North-west, and are in themselves an education and an incitement to the intending emigrant.

Officers of the Immigration Department are on hand to give all information about the laws and regulations for immigrants, and an immense mass of literature of all kinds is available to those inquiring. Notwithstanding the abundant supply, however, the demand is so far beyond expectation that care and discrimination has now to be exercised in giving it out, and absolutely nothing of this kind will be left at the close.

I venture to say that no such striking or successful advertisement of Canada's resources and Canada's possibilities as a home for settlers has ever been made, and all reports indicate that the results from this work are and will be quite commensurate with the expenditure.

The expenditure is considerable because of the difficulties of securing labour in St. Louis. It was found more economical and we were able to get more rapidly along with our work by doing a great deal of it in Ottawa and forwarding even the stands for the exhibits to St. Louis. Even with this, however, the expenses have been larger than we estimated, but I am satisfied that the results will be in even a greater degree larger than we at all anticipated when the work was begun.

As the exhibition does not close until December 1, the full report of the commissioner will be presented at the close of the exhibition, and appear in an appendix to my annual report of next year.

We have received during the year invitations to participate in the Lewis & Clark World's Fair, at Portland, Oregon, to open on June 1, 1905; and in the Universal Exposition to be held at Liege, Belgium, opening on April 20, 1905. The invitation to participate in the Liege Exhibition has been accepted. A site in this exhibition for a Canadian building is under consideration, and I am confident that we will be able to make a successful and valuable exhibit in this most important exhibition of next year.

I have noted that various trade exhibitions are annually held in the Royal Agricultural Hall, Islington, London; and have studied them with a view of using them to advantage for the advertising of our food products in Great Britain. Getting necessary information in connection therewith, I last summer decided to send an exhibit to three of these: the Confectioners', Bakers' and Allied Traders' Exhibition; the Grocers' and Allied Traders' Exhibition, and the Dairy Products Exhibition, which were held one after another in the months of September and October. I am very much pleased to find that my anticipations of the usefulness of these exhibitions were fully justified. We were able to secure the same space and use the same decorations for all three; changing the character of the exhibits according to the nature of the exhibition. The reports from all sources as to the results are very satisfactory. These exhibitions are attended by those engaged in the trade, as well as the public at large. Our participation in them has been commented upon by the trade journals with emphatic praise of our exhibits and compliments on this new departure in our work. Already the results are apparent; many dealers in London who never before handled Canadian products now carrying them as a regular portion of their stock. This effort has been so successful that I am sure it is one of the best means for advertising our food products in this unlimited market, and we have the additional advantage of securing a very great result at a comparatively small cost.

The report of those in charge of these exhibits at Islington will be found as an appendix to this report.

The climatic and other conditions necessary for the successful culture of tobacco being similar in Wisconsin to those existing in Canada, and particularly in the province of Quebec, and that State having developed a very large and profitable export trade in tobacco, it was deemend expedient, with a view to developing a like trade in Canadian tobacco, to send experts from Canada to Wisconsin to examine and inquire into the methods of planting, cultivating, growing and preparing tobacco, employed in that State. Two such experts were, in the spring, and again in the autumn, of this year, sent to Wisconsin, where they observed and made notes upon the methods employed there of preparing the soil and plant beds, of transplanting, of cultivating, of harvesting, of curing, and of packing the tobacco; and upon their return to Canada they visited the tobacco growers in several counties and gave them information of value in regard to the Wisconsin tobacco growers' methods. These experts have made a report to me upon their visits to Wisconsin; and it is my intention to

impart, during the coming winter, by lectures or otherwise, to the tobacco growers of the Dominion, the information contained in that report.

II.—ARTS AND AGRICULTURE.

BRANCH OF THE COMMISSIONER OF AGRICULTURE AND DAIRYING.

The work of this branch will be more fully dealt with in the report of the Commissioner of Agriculture and Dairying which is being prepared for a separate volume.

The organization continues to be the same as given in my last report.

The Commissioner of Agriculture and Dairying, with the officers under him, is engaged in promoting the general improvement of farm products, including live stock, seeds, butter, cheese, poultry and fruit; in facilitating the transportation of perishable articles ; in securing information regarding defects in the quality of Canadian produce, or in the methods of packing ; in studying the requirements of our various markets, and in disseminating such knowledge as will enable the producers to improve their products and extend the trade therein. The work is largely of a technical nature.

This branch differs from the Experimental Farms Branch by dealing principally with the commercial side of farming industries. It does not, to any extent, carry on experiments or scientific investigations.

The export trade of the country in most of its farm products continues to increase as shown by the following tables :—

VALUE OF SOME CANADIAN FARM PRODUCTS EXPORTED FROM 1896 TO 1904.

(Years ending June 30th.)

——	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
	$	$	$	$	$	$	$	$	$
Wheat	5,771,521	5,544,197	17,313,916	7,784,487	11,995,488	6,871,939	18,688,092	24,566,703	13,465,351
Flour	718,433	1,540,851	5,425,760	3,105,288	2,791,885	4,015,226	3,968,850	4,699,143	6,129,226
Oats	273,861	1,655,130	3,041,578	3,268,388	2,143,179	2,490,521	2,052,559	2,583,151	1,603,104
Oatmeal	364,655	462,949	554,757	396,568	474,991	487,807	344,332	537,002	756,687
Pease	1,299,491	2,352,891	1,813,792	1,955,598	2,145,471	2,674,712	1,805,718	1,052,743	1,133,268
Barley	316,028	566,505	158,978	110,040	1,010,425	1,123,055	231,199	457,233	489,437
Hay	1,976,431	999,238	357,844	411,631	1,414,109	2,097,882	4,413,411	3,595,665	1,897,730
Cattle	7,082,542	7,159,388	8,723,292	8,522 835	9,080,776	9,064,562	10,663,819	11,342,632	10,424,671
Sheep and lambs	2,151,283	1,002,011	1,272,077	1,540,857	1,894,012	1,625,702	1,483,526	1,655,681	1,545,117
Cheese	13,956,571	14,676,239	17,572,763	16,776,765	19,856,324	20,696,951	19,686,291	24,712,943	24,184,566
Butter	1,052,089	2,089,173	2,046,686	3,700,873	5,122,156	3,295,663	5,660,541	6,954,618	4,724,155
Pork, bacon and hams	4,446,884	5,871,988	8,092,930	10,473,211	12,803,034	11,829,820	12,457,863	16,029,269	13,468,768
*Poultry	18,992	56,792	97,473	139,759	210,822	141,518	238,047	160,518	140,214
Eggs	807,086	978,479	1,255,304	1,267,063	1,457,902	1,691,640	1,733,242	1,436,130	1,053,396
†Fruits	1,716,278	2,987,839	1,709,360	3,596,415	3,305,662	2,006,235	1,922,304	3,689,662	5,475,535
Totals	41,952,145	47,943,670	69,436,510	63,049,778	75,706,236	70,093,233	85,349,794	103,473,093	86,491,225

* Dressed and undressed.
† Including green, dried, canned and preserved.

There has been a much larger increase in the production of these products than is indicated in the preceding table. The increase in population and the greater prosperity of the people generally, have added to the home consumption enormously.

DAIRY DIVISION.

COOL CHEESE CURING ROOMS.

The cool cheese curing-rooms at Woodstock, Brockville, Cowansville and St. Hyacinthe, for which I asked an appropriation from Parliament in 1902, have now been in operation for three seasons. During this period 119,805 boxes of cheese have been cured at these establishments, being a sufficient quantity to make an impression on the market and to attract considerable attention. I am informed that during the past season cool cured cheese have been sold at an advance of $\frac{1}{8}$ to $\frac{1}{4}$ of a cent per pound above the highest price obtained at the same cheese boards for ordinary cured cheese. The difference in price will be greater when the superior qualities of cool cured cheese are better known.

Several lots of cheese from the cool curing-rooms were recently consigned to merchants in Great Britain with a view of getting a report on the quality of the cool cured cheese as compared with others of the same batch cured at ordinary temperatures.

The merchants who received the cheese had them examined by members of the trade in their various localities. The report on one lot was as follows :—

'(*a.*) Cool curing during the summer months is a decided improvement over the ordinary method and improves the quality of the cheese not less than 2s. and in some cases 4s. per cwt.

'(*b.*) Paraffining in some cases is an improvement when properly applied on well-made, close-textured cheese ; but does harm on mushy, soft and acidy cheese.'

Messrs. Andrew Clement & Sons, Glasgow, who forwarded this report, wrote as follows :—

'We thoroughly agree with the above report, and indeed are so much impressed with the benefits of cool curing that if practicable we should like to see it made compulsory throughout Canada, believing that the universal adoption of such an improvement would be an enormous factor in increasing the consumption of cheese and consequently benefiting the whole dairying industry of Canada.'

The cool cured lot of the foregoing consignment sold at 40 shillings, and the ordinary cured ones at 38 shillings per cwt., a difference of nearly $\frac{1}{2}$ a cent per pound.

Apart from the improvement in quality there is a decided gain by the saving of shrinkage when the cheese are cool cured. The curing-rooms were in operation from the 1st of July to the end of September in 1902, and from the 18th of May to the end of September in 1903 and 1904. The average saving of shrinkage for this period has

been over one pound per cheese. It is reported to me that a large number of cheese factory curing-rooms have already been improved along the lines illustrated by the Government Curing-Rooms, and a great many inquiries are received by officers of the department for information concerning such work.

I have authorized the improvement of several cheese factory curing-rooms in districts remote from the centres where the four government curing-rooms are located.

OFFICIAL REFEREE FOR BUTTER AND CHEESE AT MONTREAL.

During the season of 1904 the official referee for butter and cheese at Montreal has been called in to examine 923 lots of cheese and 287 lots of butter over which there were disputes as to quality between the buyer and seller. Of this number he pronounced 34 lots of cheese and 11 lots of butter as being of 'finest' quality, and his decision was accepted as final.

The officer who fills this position is also in charge of the inspectors of the extension of markets division, who are employed watching the arrival of the refrigerator cars and the loading of perishable products on steamships.

NORTH-WEST TERRITORIES CREAMERIES.

Creameries were operated during the season of 1904 at the following places: Edmonton, Wetaskiwin, (part of the season), Lacombe, Blackfalds, Red Deer, Innisfail, Tindastoll, Olds, Calgary, Qu'Appelle, Moosomin, Churchbridge and Saltcoats.

Full returns are not yet available for the season of 1904.

MARKETS FOR THE OUTPUT OF WESTERN CREAMERIES.

British Columbia has always been considered the principal market for the product of the North-west Territories creameries, but during the seasons of 1899 and 1900 some difficulty was experienced in disposing of all the butter at satisfactory prices. In both 1901 and 1902 it was found necessary to ship several carloads to Montreal for export to Great Britain. The returns from these shipments after deducting freight, &c., were rather low and disappointing.

There has been a good market in the Yukon for a considerable quantity of specially packed, first-class butter, but this trade went to the United States for several years because certain Canadian dealers filled their orders, when the country was first opened, with a very inferior article. The reputation of Canadian butter became so bad in consequence that it was found impossible to make any sales for Yukon shipment, except what was supplied to the North-west Mounted Police, until the season of 1903, when orders were secured for 90,000 pounds. The shipments have been doubled during the past season, and the assurance is given that if the quality and style of packing are maintained up to the standard of the past two seasons' supply there will be no difficulty in securing the whole of the trade, which amounts to over

half a million pounds annually. The butter for the Yukon trade is mostly put up in tins, and must be first-class in every particular, and packed in strong cases to stand the exceedingly heavy handling which it must undergo during the several transhipments.

SHIPMENTS TO THE ORIENT.

For several years past a small quantity of butter has been sold annually from the North-west creameries for shipment to the Orient, but during 1903 and 1904, (since the Osaka Exhibition), these shipments have been increased in amount over ten times, and our customers inform us that when the war is over we may look for further increases in their orders. The bulk of the oriental shipments goes to Japan, and while the total importation of butter into Japan is not large, it is claimed that the demand is likely to grow very considerably in the future.

NOVA SCOTIA CREAMERIES.

The department still operates the dairy station at Nappan, and a creamery at Scotsburn and one at Mabou. The severe drought which prevailed last summer in the localities where these creameries are situated operated against their success by cutting off the supply of milk to a considerable extent.

COW CENSUS.

A 'cow census,' so called, is being conducted in the counties of Shefford, Brome and Missisquoi, with Cowansville as a centre. Seventy-two farmers agreed to take a sample of each cow's milk, morning and evening, on three days every month, at the same time weighing the total yield of those six milkings. A box containing as many sample bottles as there are cows in the herd is sent to the farm, and when the samples for the month are all taken, it is returned to the government cheese curing-room at Cowansville, where the samples are tested. From this, and other data to be collected, a fair estimate of the actual yield of each cow will be secured. A great deal of interest has been taken in this work, which has for its object the improvement of dairy herds in the country, by encouraging the owners to weed out the unprofitable cows. The results so far obtained show an astonishing variation in the productiveness of different cows of the same breed and in the same herd.

EXPORTS OF BUTTER AND CHEESE.

The magnitude and growth of the export trade of Canada in dairy products is shown by the following tables (years ended June 30):—

SESSIONAL PAPER No. 15

Dominion of Canada—Exports of Dairy Products—Home Production.

BUTTER.

Year.	Quantity.	Value.	To Great Britain.	To United States.	To France.	To Germany.	Other Foreign Countries.	B. N. A. Provinces	British Indies.
	Lbs.	$	$	$	$	$	$	$	$
1869.....	10,649,733	1,698,042	534,707	1,015,702	.....	1,496	14,870	95,777	26,986
1880.....	18,535,362	3,058,069	2,756,064	111,158	.....	.....	24,710	163,290	2,647
1890.....	1,951,585	340,131	184,105	5,059	.....	.....	29,342	119,989	1,636
1891.....	3,768,101	602,175	440,060	10,054	.....	20,447	24,021	101,649	5,944
1892.....	5,736,696	1,056,058	877,455	6,038	.....	5,160	27,207	133,770	6,428
1893.....	7,036,013	1,296,814	1,118,614	7,539	.....	1,175	35,042	127,412	7,032
1894.....	5,534,621	1,095,588	936,422	6,048	1,125	.....	25,560	109,263	14,170
1895.....	3,650,258	697,476	536,797	5,365	.....	267	35,028	108,439	11,580
1896.....	5,889,241,	1,052,089	893,053	2,729	.....	9,370	34,299	105,472	7,166
1897	11,453,351	2,089,173	1,912,389	6,233	.....	8,513	33,490	115,754	12,794
1898.....	11,253,787	2,046,686	1,915,550	3,738	.....	17,574	31,619	51,045	27,160
1899.....	20,139,195	3,700,873	3,526,007	3,984	.....	12,384	41,810	74,813	41,875
1900.....	25,259,737	5,122,156	4,947,000	5,044	.....	7,210	43,176	66,069	53,657
1901.....	16,335,528	3,295,663	3,142,353	5,839	.....	.....	39,675	44,986	62,810
1902.....	27,855,978	5,660,541	5,459,300	41,149	.....	101	36,109	47,066	71,816
1903.....	34,128,944	6,954,618	6,554,014	10,225	.....	13	198,381	69,017	112,968
1904.....	24,568,001	4,724,155	4,400,774	6,497	14	25,644	75,014	88,422	127,790

CHEESE.

1868.....	6,141,570	620,543	548,574	68,784	.....	.....	891	1,594	340
1880.....	40,368,678	3,893,366	3,772,769	114,507	.....	.....	170	5,710	210
1890.....	94,260,187	9,372,212	9,349,731	6,425	.....	370	2,154	12,777	755
1891.....	106,202,140	9,508,800	9,481,373	13,485	.....	.....	1,954	9,104	3,884
1892.....	118,270,052	11,652,412	11,593,690	39,558	2	.....	2,124	12,942	4,091
1893.....	133,946,365	13,407,470	13,360,237	23,578	.....	.....	2,689	18,679	2,297
1894.....	154,977,480	15,488,191	15,439,198	9,552	.....	173	3,036	21,948	14,284
1895.....	146,004,650	14,253,002	14,220,505	5,058	.....	16	5,463	9,785	12,175
1896.....	164,689,123	13,956,571	13,924,672	10,359	299	.....	4,861	7,509	8,871
1897.....	164,220,699	14,676,239	14,645,850	4,486	91	24	5,365	11,954	8,457
1898.....	196,703,323	17,572,763	17,522,681	14,604	.....	1,428	6,889	12,784	14,377
1899.....	189,827.839	16,776,765	16,718,418	17,739	.....	.....	11,701	13,293	15,614
1900.....	185,984,430	19,856,324	19,812,670	4,836	.....	.....	8,774	16,651	13,393
1901.....	195,926,397	20,696,951	20,609,361	37,601	465	12	15,375	16,603	17,534
1902.....	200,946,401	19,686,281	19,620,239	12,038	.....	1,179	14,133	20,100	18,602
1903.....	229,099,925	24,712,943	24,620,004	7,779	.....	170	18,942	21,334	44,714
1904.....	233,980,716	24,184,566	24,099,004	5,386	44	.....	23,810	21,754	34,568

IMPORTS OF GREAT BRITAIN.

The following table from the Board of Trade returns of Great Britain for 14 years (ended December 31), shows the total quantities and value of butter and cheese imported into Great Britain :—

BUTTER.			CHEESE.		
Year.	Quantity.	Value.	Year.	Quantity.	Value.
	*Cwt	£ stg.		*Cwt.	£ stg.
1890	2,027,718	10,598,848	1890	2,144,074	4,975,134
1891	2,135,607	11,591,181	1891	2,041,317	4,815,369
1892	2,183,009	11,965,190	1892	2,232,817	5,416,784
1893	2,327,474	12,753,593	1893	2,007,462	5,160,918
1894	2,574,835	13,456,699	1894	2,226,145	5,474,940
1895	2,825,662	14,245,230	1895	2,133,819	4,675,130
1896	3,037,718	15,344,364	1896	2,244,525	4,900,342
1897	3,217,802	15,916,917	1897	2,603,178	5,885,521
1898	3,209,153	15,961,783	1898	2,339,452	4,970,805
1899	3,389,851	17,213,516	1899	2,384,069	5,503,004
1900	3,378,516	17,450,435	1900	2,705,878	6,837,883
1901	3,702,890	19,297,396	1901	2,586,837	6,227,135
1902	3,974,933	20,526,690	1902	2,546,612	6,412,002
1903	4,060,694	20,798,707	1903	2,694,358	7,054,710

* Cwt. : 112 lbs.

GENERAL DAIRYING SERVICE.

The Assistant Dairy Commissioner, who resides at St. Denis (en bas), devotes his time largely to the French-speaking districts of the province of Quebec. He has attended numerous meetings and delivered a great many lectures in the interests of dairying and general agriculture. He conducts a large correspondence, giving advice on various subjects, and assists in carrying on the syndicate system of cheese factory and creamery instruction which has been so successful in that province.

An instructor was sent to Prince Edward Island during the months of September and October, where he co-operated with the local instructor in giving assistance to the cheese and butter-makers on the Island.

The superintendents of the cool cheese curing-rooms were employed during the winter months in attending the annual meetings of factories, as well as special meetings arranged to discuss the advantages of the cool curing of cheese.

Numerous meetings have been attended in various parts of the Dominion by the Chief of the Division and members of his staff.

EXTENSION OF MARKETS DIVISION.

During the past year the extension of markets division has been continuing the work of : (1) assisting in the improvement of the transportation facilities between Canada and Great Britain for Canadian food products, particularly those of the more perishable sort, such as butter, cheese, eggs, fruits, &c., and (2) aiding in the extension of the sale of Canadian farm and food products in outside markets.

Under the first head came the work of inspecting and reporting upon the manner of handling, loading and unloading of farm products, from railway cars and steamers at Canadian ports and at the chief ports in the United Kingdom ; also the inspection at Montreal of refrigerator cars bringing butter and cheese from inland points for export.

The work of the division under the second head was more general in character, and was conducted chiefly by correspondence with Canadian shippers and British importers, and by the dissemination, through the medium of bulletins and the public press, of reports on the condition of Canadian food products when landed in Great Britain, and other information relating to outside markets.

INSPECTORS AT CANADIAN PORTS.

Four inspectors were again appointed for the season of navigation, at the port of Montreal to observe and report concerning the condition of Canadian food products when loaded in the steamers, the handling on the wharfs and in the process of loading, the stowage in the ships, and the ventilation of the different holds in which perishable cargo was stowed. During the season they furnished detailed reports of the shipments of cheese, butter, eggs, bacon, poultry, fruit, &c., forwarded in 281 sailings of steamers, as follows :—

From Montreal to :

Liverpool	85	sailings.
London	73	"
Glasgow	58	"
Bristol	28	"
Manchester	18	"
Leith and Aberdeen	10	"
Cardiff	2	"
South Africa	7	"
Total	281	"

During the winter season of 1903-04 one inspector was stationed at St. John, N.B., to look after the loading of food products exported via that port; and an inspector was also placed at Halifax as soon as this year's export movement in Nova Scotia apples commenced.

INSPECTORS AT BRITISH PORTS.

Inspectors appointed by the department were also stationed throughout the year at Liverpool, Manchester, London, Bristol and Glasgow. Their duties were to report fully to the chief of the markets division regarding the manner in which cheese, butter, eggs, fruit, &c., were handled in the unloading of the steamers, and the condition of these perishable products when landed on the docks. They were also instructed to do everything possible that will make for improvement in the safe discharge of cargo, and to advise the officials of the steamship lines of any rough work that might come under their notice.

It is a pleasure to state that the work of inspection maintained by my department on both sides of the Atlantic has been heartily supported by the officials of the various steamship lines concerned, and that the latter have always been ready to carry into effect any suggestions made by my officers that would promote the safe carriage of Canadian perishable products across the ocean.

During the year the leading provision firms in Liverpool, London and Glasgow have written in an appreciative strain of the beneficial results that have followed the appointment of inspectors at their ports. The following extract from a letter written under date April 18, 1904, by Messrs. G. & J. Nickson & Co. Ltd., Produce Commission Merchants, Liverpool, is fairly representative of all the letters received :

'The action of your department in maintaining inspectors at British ports for the purpose of reporting to the shippers and steamship people the manner in which Canadian products, more or less perishable, are stowed on discharge, and the condition of the goods on arrival, is having a most marked and beneficial effect on the development of the Canadian trade. My directors are of opinion that your department is to be very highly congratulated on the painstaking and helpful manner in which you are studying the largely developing trade between this country and Canada.'

INSPECTION OF REFRIGERATOR CARS.

Last season the work of inspecting the refrigerator cars bringing butter and cheese into Montreal for export, was placed under the direction of the extension of markets division. Two travelling inspectors were employed, whose duty it was to observe and report the condition under which butter and cheese were hauled from the factories to the railway stations, the temperature of the butter when loaded into the cars, and the condition of the cars as regards icing and cleanliness. They also visited the creameries that make use of the refrigerator car service, for the purpose of examining the cold storage chambers, and urging upon the creamery managers the im-

portance of keeping their butter at the lowest possible temperature, from the day it is made until it is loaded into the iced car.

Two inspectors were also stationed at Montreal. They examined the iced cars containing butter and cheese as they arrived and reported on the condition and temperature of the contents, as well as the condition of the cars as regards icing and cleanliness. The same packages of butter that had been tested at the shipping point were again tested at Montreal, in order to ascertain if the contents had become warmer or cooler during the journey. In this way much useful information was secured, and, at the same time, the weak spots in the service were located and strengthened. Any defect or deficiency, such as broken or clogged drainage pipes in the cars, badly fitted doors, lack of ice, &c., was promptly reported to the proper railway official, and the matter complained of was usually remedied forthwith. Moreover, the presence of an inspector was a constant check on the employees of the railway and cartage companies, and promoted the careful and prompt handling of the butter and cheese.

The refrigerator car service for butter was in operation from the 16th of May until the 22nd of October. In that time the two inspectors stationed at Montreal inspected 975 cars containing the following produce: 335,555 pkgs. butter, weighing 21,798,143 pounds; 10,285 boxes cheese, weighing 810,584 pounds; 421 cases eggs, weighing 27,500 pounds; 162 pkgs. lard, weighing 8,400 pounds. The cars containing a mixed freight did not form a part of the subsidized service, the latter with a few exceptions carrying butter only.

During the season the inspectors also recorded the temperatures of 2,296 packages of butter.

EXPORTS OF CANADIAN FARM PRODUCTS.

In the fiscal year ended June 30 last, the total exports of Canadian agricultural and animal products were valued at $100,950,992. These figures show a considerable reduction on those of the previous year, but the deficiency was largely caused by a shrinkage of $11,101,352 in our exports of wheat. On the other hand our exports of flour surpassed those of the previous year by nearly a million and a half of dollars.

During the past year, Great Britain, as formerly, proved the best customer for our farm products, taking over 90 per cent of our total exports. An ample margin remained, however, for the further extension of our trade in the United Kingdom, as, for every $100 worth of food and farm products supplied the mother country by Canada, other countries furnished her about $747 worth. This assertion is borne out by the following comparative statement, which shows the value of some Canadian farm products exported (*a*) to all countries, and (*b*) to Great Britain, in 1904; also the total value of the imports of similar products into Great Britain, in 1903 :—

Value of some Canadian Farm Products exported in the year ended June 30, 1904.	To all countries.	To Great Britain.	Value of Products of the same sort imported into the United Kingdom from all countries in the year ended December 31, 1903.
	Dollars.	Dollars.	Dollars.
Butter	4,724,155	4,400,774	Butter ... 101,220,369
Cheese	24,184,566	24,099,004	Cheese ... 34,330,951
Eggs	1,053,396	1,036,035	Eggs ... 32,205,746
Poultry—Dressed or undressed	140,214	107,509	Poultry ... 5,855,019
Bacon	12,603,521	12,590,669	Bacon ... 66,279,815
Hams	418,740	406,051	Hams ... 16,510,527
Pork	446,507	23,851	Pork ... 9,123,618
Wheat	13,465,351	13,106,081	Wheat ... 145,710,652
Flour	6,129,226	3,568,430	Flour ... 47,316,634
Oats	1,603,104	1,213,413	Oats ... 20,751,116
Oatmeal	756,687	644,219	Oatmeal ... 2,615,420
Pease	1,133,268	525,102	Pease ... 3,361,587
Barley	489,437	330,401	Barley ... 35,133,995
Hay	1,897,730	974,678	Hay ... 2,710,451
Cattle	10,424,671	10,046,651	Cattle ... 44,817,727
Sheep and lambs	1,545,117	721,358	Sheep ... 2,657,506
Apples—Green or ripe	4,590,793	4,379,826	Apples—Green or ripe ... 13,535,893
Total	85,606,483	78,174,052	Total ... 584,137,026

During the year under review a noteworthy feature of our export trade in foodstuffs, to countries other than Great Britain, has been the remarkable increase in the exports of Canadian flour to Japan. According to the Japanese trade returns only $5,940.19 worth of Canadian flour was imported into Japan during the first eight months of the year 1903, whereas $81,755.67 worth was imported in the corresponding period in 1904.

In South Africa the financial depression still lingers and business has not yet resumed its normal aspect. Despite the adverse conditions, however, considerable quantities of Canadian foodstuffs have been shipped to that market by each monthly steamer of the direct Canada-South Africa line, and it is expected that the tariff preference recently granted to Canada by South Africa will stimulate our exporters to greater efforts in the future.

BULLETINS.

In the past year the following bulletins have been issued by the Extension of Markets Division :—

SESSIONAL PAPER No. 15

No. (New series). Contents.

17 Cidermaking in England and Canada; demand in Great Britain for black currant pulp.

18 The work of the Extension of Markets Division; Canada's export trade in farm products.

19 Notes on the export apple trade.

20 The Canadian poultry trade with Great Britain; Canadian butter and bacon in the Glasgow market.

21 Some notes on the Canadian trade in food products with Bermuda and Jamaica.

22 Hamburg as a market for Canadian apples.

SEED DIVISION.

The work of the Seed Division has been continued during the past year with a view to (*a*) encourage the production and use of pure and selected seed of farm and garden crops, and (*b*) study the condition of the seed trade in its relation to the progress of agriculture.

CANADIAN SEED-GROWERS' ASSOCIATION.

The plan adopted by Professor Robertson, five years ago, to encourage the direct application of the principles which make for the improvement of farm crops by the systematic selection of seed from year to year, led up to the formation of the Canadian Seed Growers' Association at a meeting held in Ottawa, June 15 and 16. This organization is an outgrowth of the Macdonald-Robertson Seed Growers' Association. The minutes of the meeting, together with some general explanations regarding the growing, selecting and preserving of seeds intended for registration, have been published for distribution.

The object of this association is to advance the interests of seed-growers and other farmers by:

(*a.*) Making regulations respecting the growing, selecting and preserving of seeds of various kinds of farm crops for the guidance of its members.

(*b.*) Causing records to be kept of the history of seeds produced by members.

(*c.*) Fixing standards for seeds that may be eligible for registration.

(*d.*) Publishing information as to standards.

(*e.*) Issuing certificates of registration to members by which hand-selected seed or the product therefrom may be known from other seed.

(*f.*) Such other means as may be expedient from time to time.

Records of the history of seed of wheat, oats, barley, maize, flax, millet, pease and beans, also seed potatoes, produced by member are kept by the seed division. Certificates of registration are issued to members for seed that has had the benefit of at least three consecutive years of hand-selection. Four instructors in seed-growing and seed-selection are now employed by the department to act in the capacity of district superintendents of the association. Their work is largely of an educational nature: their inspection of the operations of seed-growers serves also to protect the interests of the association against fraudulent practices.

SPRING SEED FAIRS.

I authorized the officer in charge of the seed division to continue to assist in holding the spring seed fairs that were started last year, and to further develop this plan for providing special markets, at other central points, for the sale and exchange of seeds among farmers. Twelve seed fairs in all were arranged for and successfully held during the early spring months. Large quantities of high-class seed grain and potatoes were disseminated among farmers through the medium of these fairs. The prizes that are awarded each year for the best lots of seed brought out in quantity for sale do much to encourage care in selection and thorough cleaning of grain for seed purposes.

SEEDS TESTED FOR PURITY AND VITALITY.

It is gratifying to note the growing desire on the part of farmers to have definite knowledge of the purity and vitality of the seed they use, and the efforts of an increased number of seed merchants to supply farmers with seed of the best quality. Five hundred and eighty-four samples were tested for farmers and seven hundred and thirty-one samples for seed merchants during the past year. These were largely seeds of grasses, clovers, cereals, root crop and garden vegetables. Additional germinators and other equipment have been installed in the seed laboratory in order that the efficiency of the service may be maintained.

Five hundred and four samples of seed—principally of grass and clover seed—were secured by direct purchase from seed merchants in all parts of Canada, for the purpose of obtaining further information regarding the quality of the seed offered for sale in the various districts. The results of the analysis of those seeds gives evidence of a marked improvement in quality over those collected for the same purpose in previous years. The educational work in the matter of good seeds that was started by the seed division two years ago and carried on in all of the provinces through the medium of farmers' institutes, and newspaper and bulletin publications, has been fruitful of good results.

BILL RESPECTING THE INSPECTION AND SALE OF SEEDS.

After conferring with many of the seedsmen regarding the Bill respecting the Inspection and Sale of Seeds, that was introduced and discussed in parliament last year, I had its main principles embodied in a new Bill in a way to mitigate those

features which, it was contended, would unduly hamper seedsmen in their business. The amended Bill was introduced and discussed in parliament during the recent session, but on account of pressure of other important business, it was not made law. The object of the Bill is to supplement the educational work that is done, by providing an Act that may serve largely to prevent the further dissemination of seeds of noxious weeds through the medium of the trade in agricultural seeds, and to discourage unscrupulous seed merchants from misrepresenting the quality of grass and clover seeds sold by them to farmers.

COLD STORAGE DIVISION.

COLD STORAGE AND COOLED AIR ON STEAMSHIPS.

Although the Department of Agriculture is not paying any further subsidies to the steamship companies for the fitting up of steamers with 'cold storage' or 'cooled air' service, the various steamship lines are adding to their equipment from time to time in order to meet the growing demands for space of this description. The steamers have handled the large increase in the shipments of butter during the past season without serious shortage of space. Shippers have availed themselves very much more extensively than in previous years of the 'cooled air' service for the carriage of cheese. Thermographs have been placed in practically all the cold storage and cooled air chambers, and also in ventilated compartments along with butter and fruits. Copies of the thermograph records are filed in the Exchange Room at the Board of Trade, Montreal.

Particulars of the cold storage service and the amount of produce carried will be given in the report of the Commissioner of Agriculture and Dairying to be published as an appendix to this report.

REFRIGERATOR CARS FOR BUTTER.

The refrigerator car service for the carriage of butter was again operated by the railway companies under arrangement with the Department of Agriculture. Cars were started at 49 different points, and were available for shipments of butter at all stations on the routes to Montreal. The cars were run, weekly or fortnightly, according to the requirements of the route on an advertised schedule, so that shippers might know when to deliver the butter at the stations with the least possible exposure to heat.

Shippers were charged the current rates without extra charge for icing.

This service was in operation from May 18th to October 22nd. The department guaranteed two-thirds of the earnings of a minimum car, (20,000 pounds), plus $4 a car for icing. When the earnings exceeded the guarantee there was no charge against the department. If the traffic on any route exceeded one carload, the whole service on that route was held to be self-sustaining, and no claim could be made on the department, even if the earnings of the extra cars did not reach the amount of the guarantee.

The arrangement did not apply to special cars for taking a full carload from a single point.

The subsidy, or guarantee, was given to secure a regular iced car service for shippers of comparatively small lots, who would otherwise be compelled to pay for a whole car, or hold the butter until a carload was accumulated, in which case there would be serious deterioration in the quality of the butter.

Inspectors were employed going over the refrigerator car routes, reporting regularly on the working of the service, and endeavouring to have defects in the handling of the butter remedied as promptly as possible, whether they occurred at the creamery, in the hauling to the station, or while the butter was in charge of the railway company.

REFRIGERATOR CARS FOR CHEESE.

The department agreed to pay the cost of icing 105 cars a week, distributed among the different railroads, for the carriage of cheese to Montreal from July 1 to September 10.

The railway companies agreed to furnish the cars, properly iced, upon application from shippers, for the transportation of cheese in carloads, up to the number allotted to each carload. Although the summer was an exceedingly cool one, this service is reported to have been of great advantage.

COLD STORAGE AT CREAMERIES.

The bonus of $100 to creamery owners who constructed proper cold storages in connection with their creameries was continued for the year 1904.

FRUIT DIVISION.

Mr. W. A. MacKinnon resigned his position as chief of the fruit division during the year, and Mr. A. McNeill, formerly chief fruit inspector, was appointed in his stead.

While the fruit division is chiefly concerned with the administration of the Fruit Marks Act, more and more educational work is being undertaken every year. The fruit inspectors during the past year attended 130 orchard meetings, at which various topics of orchard management were discussed. The inspectors also attended fall fairs whenever possible, to give demonstrations in the proper methods of packing and marking fruit.

Demonstrations of systematic power spraying were carried on during the year in the neighbourhood of Wolfville, N.S., and also near Ingersoll, Ont. About 3,300 trees were sprayed several times during the season by each outfit. The success of this work is demonstrated by the fact that a number of co-operative societies and individual farmers have already adopted this method of treating their orchards.

A new feature of the work of the division, in 1904, was the issuing of fortnightly reports dealing with the prospects for the Canadian fruit crop, and the demand likely to exist for it in foreign markets. These reports were compiled from information received regularly from over five hundred correspondents in various parts of the country. The reports were sent to any person making a request for them.

The fruit inspectors and the members of the trade in Great Britain report a marked improvement in the packing and marking of Canadian fruit, since those engaged in the fruit industry in Canada have become more familiar with the provisions of the Fruit Marks Act. During the season of 1903-4, special attention was paid to the handling of fruit for export from the port of Montreal. Some complaints had been received regarding the way in which packages were handled during transhipment from railway cars to the steamers.

The inspectors have reported the actual examination of 20,702 packages of fruit belonging to over 2,000 lots, aggregating some 234,343 packages.

The Fruit Marks Act having now been in operation for three years was rather more strictly enforced this year than heretofore. Forty-nine prosecutions resulted in as many convictions.

POULTRY DIVISION.

Experimental and illustrative work is being carried on by the poultry division in the different provinces, largely through the medium of the breeding and fattening stations. The work of these stations is directed with a view of finding out the cheapest and most suitable houses to build, the most practicable incubators and brooders to use, the best utility breeds and types of fowl, the best way to manage young and growing chickens, and the best methods of feeding, killing and marketing the same. A type of fowl is being developed at the breeding stations which makes a profitable table bird and at the same time produces a good laying strain of pullets. These pullets are being sold to the farmers, at reasonable prices, for breeding purposes, as are also the eggs for hatching.

The diversity of climatic and other conditions in Canada multiply the difficulties in the way of successful poultry raising. For instance, a poultry house suitable for parts of British Columbia would not do so well in Manitoba; feeds which are cheap in Montreal might be out of reach in Alberta; the incubators and the instructions for their operation that give good results in Cape Breton or in Vancouver might not be satisfactory for the higher altitude of Calgary. These, and many other questions, the poultry division is endeavouring to solve.

The poultry stations are not expected to show a profit on the total expenditure: their work is too largely educational for that. The results must be looked for in the increased interest taken in these matters, by the desire on the part of the farmers to improve their stock, and by the improvement of poultry in general. As a result of this improvement prices are advancing. Throughout the older provinces where the stations were first established the farmers have

adopted many of the methods advocated at these stations. They are buying incubators, making brooders, crate-feeding their cockerels, and in place of selling them at six months for 25 and 35 cents a pair as was the case several years ago, they are now realizing from 50 to 80 cents for them at four months old. Dealers prefer to handle crate-fatted birds at several cents a pound advance in price, because consumers are willing to pay the increased price for the superior article.

Three new stations have been started this year at the request of many prominent farmers and poultry men, one in Quebec and two in Manitoba, and it has been arranged to start one in British Columbia next spring.

The managers of all the stations are expected to give every assistance to local men who are engaged in the poultry business. They frequently attend institute meetings and fairs, with exhibits to illustrate the work carried on at the stations.

During the past year the department has not shipped any quantity of dressed poultry to the old country, giving more attention to the development of the local markets. The efforts made in this direction have been attended with the most gratifying results.

LIVE STOCK DIVISION.

PLAN OF WORK UNDERTAKEN.

As explained in previous reports, the live stock commissioner has undertaken six special lines of work, viz.:

1. The establishment of farmers' institute systems in each province where such were not already in operation, and the improvement of such systems as already existed.

2. The improvement of agricultural societies and exhibitions.

3. The establishment of provincial auction sales of live stock.

4. The extension of interprovincial trade in live stock.

5. The establishment of interprovincial live stock associations and provincial educational shows.

6. The publication of bulletins on live stock and kindred subjects.

A brief outline of the year's work, with special mention of valuable features recently adopted, is attached.

BRITISH COLUMBIA.

Farmers' Institutes.

In March and April, Major Jas. Sheppard was sent to British Columbia, and he, assisted by local men, conducted thirty-three institute meetings with an aggregate attendance of 892 or an average of 27. A large number of these meetings were held in the sparsely settled districts which had never before been reached in this way. The meetings were all well attended. Many came long distances to attend, and the interest manifested was very gratifying to the speakers.

Fairs Improvement.

Four judges were sent in autumn of 1904 to attend a number of leading fairs in the province. After the fairs, these men remained to address a series of institute meetings which had been arranged at the request of the division by the Deputy Minister of Agriculture for the province.

NORTH-WEST TERRITORIES.

Judging Classes.

In the months of January and February, short courses in stock-judging were given at seven principal stock centres in the Territories. At each place a two or three days' meeting was held, the daylight sessions in every instance being devoted to teaching practical stock-judging, and the evening sessions to discussions of various agricultural subjects.

Mr. Geo. Harcourt, superintendent of institutes and fairs for the Territories, assisted the live stock commissioner in arranging these courses.

MANITOBA.

Judging Classes.

In February, a series of short courses in stock-judging was arranged by G. H. Greig, the representative of the live stock division in the province and secretary of the live stock associations there, with the assistance and co-operation of this division. Speakers were sent out who conducted the classes. These were organized at Neepawa, Brandon and Winnipeg, and were largely attended. The keenest interest was taken in the judging classes during the day and in the discussions on subjects related to practical agriculture in the evenings. These short courses in stock-judging bid fair to become the most profitable line of educational work of this nature yet attempted.

ONTARIO.

First Spring Stallion Show, Ottawa.

In February, the Eastern Ontario and Quebec Horse-breeders' Association organized, with headquarters at Ottawa. This association held its first Annual Spring Stallion Show in connection with the Eastern Ontario Fat Stock and Dairy Show, in March. A very successful exhibition was held, with over sixty registered stallions entered. The educational features of the show were developed as much as possible. Addresses by the best qualified men that could be procured were given on conformation, breeding, feeding, stabling and markets. A keen interest was maintained throughout, and the success of the show was very gratifying.

Building for Winter Fair at Ottawa.

So favourably were the people impressed last year with the educational value of a winter fair, that the city of Ottawa undertook to provide a large and suitable building and to place it at the disposal of the Live Stock Association for this purpose. Accordingly, the city council erected this year a large and well-equipped building costing upwards of $25,000.

Third auction sale, Ottawa.

An auction sale of pure bred cattle was held in Ottawa in April, at which twenty-nine cattle were sold at an average price of $67.25. A number of the animals offered were calves that had recently been weaned which accounts in a large measure for the somewhat lower average than had been reached in previous years.

QUEBEC.

In January, February and March, a series of Farmers' Institute meetings were held. As far as possible at least one meeting was held in every county in the province. In the case of counties in which there were both English and French speaking districts, meetings in both French and English were held. These meetings were very widely and persistently advertised, the co-operation of prominent local men was in each instance solicited by correspondence weeks before the meetings, these men were asked to exert themselves to work up local interest, and nothing was left undone that seemed likely to contribute to the success of the meetings. The result amply justified the effort. The total attendance at these meetings was 22,277, or an average of a little over 220, most of whom were farmers. The lecturers were unanimous in reporting an increased interest in the topics discussed.

By my direction this division undertook to assist the directors of the Brome Agricultural Society to conduct a model fair.

FAIRS IMPROVEMENT.

A portion of the fair grounds, therefore, was set apart for experimental plots. This was divided into three ranges, which were each sub-divided into plots 12 x 15 feet, and sown with the crops indicated in the subjoined diagram.

Hairy Vetch.	Mangolds Yellow Intermediate.	Red Clover.
Grey Vetch.	Mangolds Long Red.	Mammoth Red Clover.
Turnips, Greystone.	Carrots, White.	Alsike.
Turnip Swede.	Butter Corn.	Lucerne.
Forage Mixture (oats, pease, vetch)	White Cap Yellow Dent Corn.	Orchard Grass.
Forage Mixture (oats, pease, wheat)	Champion White Pearl.	Brome Grass.
Japanese Barnyard Millet.	Leaming.	Tall Oat Grass.
Rape and Millet.	Red Blaze Corn, Sandford Corn.	Meadow Fescue.
Rape.	Potatoes.	C. E. F. mixture hay or pasture.
Rape.	Potatoes, sprayed.	O. A. C. mixture hay or pasture.

On the day of the fair Mr. C. A. Zavitz, Prof. of Field Husbandry at the Ontario Agricultural College, Guelph, lectured on the characteristics and usefulness of the various crops grown. These talks attracted large and appreciative audiences, many interesting discussions were provoked and much valuable information elicited.

Competent judges were furnished to this society for all classes of live stock. These expert judges explained the reasons for their decisions whenever called upon to do so, pointing out to the spectators the desirable and undesirable points in the various animals under consideration.

Expert judges were also furnished who did the same work in the same way at Huntingdon, Stanstead and Buckingham.

NEW BRUNSWICK.

Farmers' Institutes and judging classes.

Speakers were again sent to the Annual Convention of the Farmers' and Dairymen's Association which met in March. Farmers' Institute meetings were also held at Woodstock, Sussex and Chatham. These were well attended and much interest taken. Judging classes were held and valuable discussion provoked.

Fairs improvement.

A special effort was made this year to assist the management of the provincial exhibition at St. John.

They wished to make their fair more educational and to this end asked the co-operation and assistance of the department. It was agreed that this division take control of the judging of the agricultural and horticultural products, and of all the classes of live stock except light horses.

The judges delivered addresses in the ring as before described. This proved a very valuable and popular feature of the exhibition, attracting large audiences of intelligent people.

School Children's Exhibits.

A special effort was made at this exhibition to encourage school children's exhibits after the plan outlined in previous reports. The results were very gratifying. Eighty-three collections in all were exhibited, many of them comprising upwards of 100 specimens carefully mounted. These exhibits all bore evidence of much care in collecting, mounting and naming. For extended notes see report of Live Stock Commissioner, 1903-04.

The management reports that this exhibition was the most successful ever held in St. John.

Judges were also sent by this division to three of the largest and most important county fairs in the province : viz. Sussex, Woodstock and Chatham.

After these fairs the judges remained in the province to address a series of Farmers Institute meetings. In all 94 meetings have been arranged for and are now in progress.

NOVA SCOTIA.

At the request of the Hon. J. W. Longley, the Live Stock Division co-operated with the management of the provincial fair at Halifax to make it more educational. Judges were furnished for all classes of stock except light horses. Addresses were delivered by the judges in the ring and explanations of the awards given. Particularly strong points in the various animals were brought to the attention of the spectators and exhibitors. In this way interest in the judging was maintained and valuable information imparted in a practical way. Provision was made for a farmers pavilion and lecture hall and a daily programme of lectures and discussions on subjects of interest to farmers. The programme of lectures and judging was printed and widely distributed so that visitors knew at a glance what was going on at any given time in any department of the fair.

PRINCE EDWARD ISLAND.

Fairs Improvement.

At the request of the management of the provincial fair at Charlottetown, this division took charge of the judging of agricultural and horticultural exhibits, in addition to all classes of live stock except light horses, and provided a programme of lectures for each afternoon and evening during the progress of the fair. As in the case of Halifax, a suitable pavilion was provided, the evening lectures being illustrated with stereopticon views. These lectures attracted large and interested crowds and proved a valuable innovation.

NATIONAL ASSOCIATION.

In March, 1904, the First Annual Convention of Canadian Stock Breeders ever held in Canada met in Ottawa. This convention was called by me, and was the most important event of recent years in connection with Canadian live stock interests.

Purposes of Convention.

The purposes of this convention were to bring the stock men of the various provinces together to discuss questions of national importance that could not be dealt with by provincial associations, and incidentally to lead the breeders of the different provinces to realize that their interests are mutual and are broader than provincial limits; that the prosperity of the live stock men of any province is an advantage to the whole Dominion. It was also believed that by bringing the leading stock men of the country together for the discussion of subjects in which they have a common interest a friendly feeling would be engendered and interprovincial trade thereby promoted.

The result of the convention amply justified its being. The important subjects introduced were discussed in an exhaustive manner. For complete report of this convention see Live Stock Commissioners' report, 1903-04.

EXPERIMENTAL FARMS BRANCH.

Considerable progress has been made during the past year in all the divisions of the work carried on by the experimental farms and their continued usefulness amply demonstrated. At the time these valued institutions were established it was intended that they should become bureaus of information where farmers could apply for advice on all agricultural and horticultural topics whenever required. That they have served this purpose in a notable degree is evident from the rapid and persistent growth of the correspondence had with farmers at all the farms.

MUCH INFORMATION GIVEN TO FARMERS.

In 1888, the first year after the farms had become well organized, the number of letters received at all the farms was about 8,000; within three years the number had increased to over 20,000, and for the past six years they have averaged yearly 66,222. During the same period the number of bulletins and reports sent out annually has averaged 220,646. Thus a constant stream of information has been going out from the farms carrying untold benefits to farmers to the remotest corners of the Dominion. A large number of farmers visit the experimental farms to gain information by observation. These see the work in progress, study the marked benefits to be derived from it and go home to put in practice what they have learned.

THE WAY PREPARED FOR AGRICULTURAL ADVANCEMENT.

The experimental farms have prepared the way for agricultural advancement, and have by experimental work furnished proof of the value of modern ideas and improvements, and have thus led to their more general adoption.

ADVANTAGES OF EARLY SOWING.

The gain resulting from the early sowing of cereals has been clearly demonstrated in a series of experiments which were carried on for ten years. Each year, six successive sowings were made at intervals of a week on plots of one-tenth acre with two varieties each of wheat, oats, barley and pease. The results furnished conclusive proof that delay in sowing resulted in loss of crop, the loss becoming more serious as the delay was greater. The conclusions reached from these experiments have been widely published, and farmers have been led to give increased attention to early sowing, and crops have thus been increased.

BENEFIT TO FARMERS BY CO-OPERATION.

Not only have Canadian farmers reaped much benefit from the experiments conducted at the experimental farms, but by providing them with material and suggestions, they have done some experimenting for themselves, by testing on their own farms some of the most promising varieties of the leading agricultural crops. They have thus gained for themselves important information as to the relative usefulness of the more promising sorts of cereals and other crops in their own climate and on

their own soil. The extent of this work, which is going quietly on in every part of the Dominion, and the benefits arising from it, are but imperfectly understood by the public generally. More than 40,000 farmers, scattered throughout the length and breadth of Canada, take part in this work annually, and to provide the 70 to 75 tons of material required for this purpose, which is always of the best and purest, needs much careful consideration and forethought. The value of this part of the work it is difficult to overestimate; it is greatly appreciated by farmers everywhere, but to the new settler in this country it is a great boon, as he may thus be at the outset provided with a start in the cultivation of varieties proven to be the most prolific and of the best quality obtainable. If handled carefully, the samples sent him will, by the end of the second or third season, supply him with all the seed required for cropping large areas of land.

INVESTIGATIONS CONTINUED.

Among the more important branches of experimental work conducted from year to year are the comparative trials made with different sorts of artificial fertilizers, and with combinations of these fertilizers, as compared with barn-yard manure, to ascertain their relative influence on different crops; the experiments conducted to gain further information as to the value of clover for ploughing under to enrich the soil; the testing of many different sorts of fodder crops, and the comparative trials made with all the best varieties of cereals and other important farm crops obtainable. New cross-bred sorts of grain have also been produced and are being tested in comparison with the best sorts now in cultivation. Additional new cross-bred varieties of fruits have also been produced for trial in the North-west country. These and many other important lines of work have been zealously pursued by the several officers composing the experimental farm staff, during the past year, with good results.

USEFUL BULLETINS RECENTLY ISSUED.

During the year, under my direction, some valuable publications have been issued and distributed widely among the farmers of Canada. These include Bulletin 44, in which is published the results obtained in 1903 from trial plots of grain, fodder corn, field roots and potatoes, prepared jointly by the director and the experimentalist; Bulletin 45 on Alfalfa, prepared jointly by the agriculturist, the chemist, and the entomolgist and botanist; Bulletin 46 on Emmer and Spelt, by the experimentalist, with an appendix by the assistant chemist, and Bulletin 47 on Trees and Shrubs tested in Manitoba and the North-west Territories, by the director. This last bulletin embodies the results of the tests carried on at both the western experimental farms for the past fifteen years to determine the relative hardiness of many different sorts of trees and shrubs in the Canadian North-west, and will be found a useful guide to all who may desire to adorn their homes or grounds with these objects of beauty in the north-west country.

CONTRIBUTIONS TO EXHIBITIONS.

Large contributions of agricultural material were got together from the crop of 1903 and prepared at the several experimental farms for display at the Louisiana

Purchase Exposition at St. Louis. These consisted mainly of grain of many sorts, both in straw and threshed, also fodder crops, grasses, fruits and vegetables in great variety, also honey. An exhibit of roots and potatoes was likewise sent to St. Louis from the experimental farm at Brandon in the autumn.

Similar material was also provided for the exhibitions of Canadian products made during the past year in Great Britain and a considerable quantity of suitable material has been got together from the crop of 1904, for display in connection with the Canadian exhibit to be made at Liege, Belgium, during the season of 1905.

ATTENDANCE AT MEETINGS.

Under my instruction the officers of all the experimental farms have attended some of the more important meetings of farmers and fruit-growers held in different parts of Canada. This assistance has been much appreciated by those attending such meetings, and at the same time opportunity has been afforded for bringing more prominently before the farming community the results had from many useful lines of work carried on at the several farms.

AGRICULTURE AND LIVE STOCK DIVISION.

In the agricultural division the work carried on during the past year has been: (*a*) a study of methods of soil improvement (*b*) a study of soil cultivation, and (*c*) a study of the comparative yield of the different more commonly cultivated crops when grown under similar conditions.

The soil.—For five years a rotation of five years duration had been followed on the farm proper, and very marked results noted, so marked indeed that it has been decided to try to determine the comparative value of a number of rotations of different lengths and descriptions as factors in soil improvement. Twelve different rotations are now under test, and one year's work has been done with each. The results are as yet, of course, quite far from being conclusive.

In addition to the experiments in rotations a study is being made to determine if possible the effect of deep as compared with shallow ploughing, and the question of early as contrasted with late fall ploughing is also receiving careful study; the results so far go to show that the early ploughing, if at all possible of accomplishment, is by a good deal the more advisable.

Crops.—The field crops common to Canada are grown, and a study is being made of their comparative economy as food or forage producers.

Indian corn is grown extensively and has been found to be exceedingly valuable as a feed for all classes of live stock, both as grain and roughage. It has been found to be much more economical to preserve it as ensilage and feed it to cattle in that form than to attempt to dry it in the stook, as is very commonly done.

Roots have been grown extensively and have been compared with corn as to economy of production, and value as feed for different classes of live stock.

Different sorts of oats are grown extensively, and our experience goes to show that for this part of Canada the Banner is easily the heaviest cropper.

Clovers are grown quite largely, and our results show that as soil improvers and food producers combined they are of unsurpassed value to the farmer.

Alfalfa has been grown for a number of years with great success, and a bulletin on its culture and use has been written, and was issued in June last.

In the animal husbandry division work is being done with dairy cattle, beef cattle, steers, sheep and swine, to determine the comparative economy of different foods as milk and flesh producers, and to determine the most economical rations, or food mixtures, to feed.

Dairy cattle being recognized as the most important class of live stock in this part of Canada, are kept in considerable numbers, and numerous experiments have been conducted with them to gain information as to the best feeds for them, the best methods of feeding, the best classes to keep, the best lines of breeding to follow, the influences of different feeds and conditions on the milk yield and quality, and the best care to give in both summer and winter.

Beef cattle are kept in small numbers. An effort is being made to ascertain whether it is possible to combine dairying and beef production profitably in the same herd. Results, so far, seem to indicate that, while it can be done profitably, there is much more profit in keeping a purely dairy herd.

Steers are fed quite extensively for beef production and have during the last year been fed to determine : the best feeds to feed, the best age at which to fatten off, the best method of housing them, the best way to bed them, and the comparative value of certain feeds.

Swine.—The production of pork for bacon manufacture is always a problem of primary importance, and some experiments are always under way with a view to gain some light on the various difficulties which meet the pork producer at every turn. During the last year it has been attempted to gain some information as to the best method of wintering fall litters and the best feeds to give them. The results secured seem to show that it is quite impossible to winter small pigs profitably unless a good warm pen, well lighted and well ventilated is available. The best foods of all to feed such pigs seem to be shorts and skim milk ; where skim milk was not used a small addition of oil cake to the shorts seemed to be the best substitute, about one oil cake to eight or less of shorts.

Sheep.—Two breeds of sheep are kept on a small lot of ground and an effort is being made to determine if possible the number of sheep that may be kept on a given area and the profit that may be expected from them. The breeds kept are the Shropshire and Leicester.

HORTICULTURAL DIVISION.

During the past year the work of the Horticultural Division has progressed favourably, and although the winter of 1903-4 was very severe, killing many apple and plum trees and weakening others, the orchard on the whole looked well.

Much experimental work was carried on and information gained which will be of value to horticulturists in Canada.

Notwithstanding the damage done to fruit trees, last winter was one of the best test winters there has been since the Central Experimental Farm was established. About 700 varieties of apples have been tested at Ottawa, and while some of these had killed out from time to time, after a few years' test there were still many others which up to last winter were of doubtful hardiness. A large number of these were killed by the severe frost, and it is now possible to say more definitely what kinds among those tested will be found quite hardy, where as severe a winter as last winter is likely to occur. This definite information will be of the greatest value to persons intending to plant trees. A large number of varieties which had not proven hardy when grown in the ordinary way had been top grafted during recent years, in order to learn whether they would succeed when grown on hardy stocks. These were practically all killed to the stock last winter, thus proving that they were not made much, if any, hardier in wood by top grafting.

Experimental shipments of apples to Ireland.—Five shipments of apples in boxes were made to Ireland this year, the object being to learn whether in a season when the markets of Great Britain were glutted with home grown fruit there would be a good sale for Canadian apples in Ireland. The experiment indicated that there were sufficient summer apples grown in Ireland to meet the local demand, and Canadian summer apples of the Duchess type were not wanted. The first three shipments barely covered expenses, but the Wealthy apples sent later sold at 4-6 a box, which allows a fair, though not large, profit to the shipper, and more of this kind were asked for. All the apples reached Ireland in good condition.

Seedling Fruits.—A large collection of seedling fruits, especially of apples, is being brought together at the Central Experimental Farm, and some of these are proving very desirable. The originators of these fruits send samples to the horticulturist, and if thought worthy of trial scions are asked for, in order that the varieties may be further tested. A number of new seedling varieties was added to the collection this year. A large number of seedlings of the best varieties which have fruited at Ottawa are also under test, and more of these were planted again this year. Some work was also done in crossing apples, the aim being to get a first class hardy winter fruit.

Experiments in Spraying Potatoes.—Although it has been proven at the Central Experimental Farm and elsewhere over and over again that spraying with Bordeaux mixture will prevent blight and rot, farmers are still slow to take advantage of this remedy. Experiments are, therefore, continued in order to keep this important fact prominently before them, new mixtures being tried with the other for comparison of results. Potatoes which have been sprayed have averaged much more per acre than where left unsprayed.

Tobacco Experiments.—Each year a test is made with different varieties of tobacco, and notes are taken on the growth, yield and relative maturity of each. Some good tobacco was grown this year.

Forest Belts.—The forest belts which bound the north and west sides of the farm are affording valuable object lessons to farmers and others of the advantage of planting trees. In these belts—the planting in which was begun seventeen years ago—are to be found most of the best Canadian timber trees, which are being grown for the purpose of determining their relative growth, both when grown in blocks of single species and in mixed plantations. Measurements are taken each year of the average trees of the different kinds, so that definite information may be obtained of their rate of growth. The shade-enduring capacity of the different species is also being noted in the mixed plantations, some kinds being killed outright when shaded, while others live on though making little growth. Other useful purposes of these belts are to serve as windbreaks to the farm, and to improve the landscape.

Arboretum and Botanic Garden.—The arboretum and botanic garden at the Central Experimental Farm is for the purpose of growing and testing trees, shrubs and herbaceous plants, in order to learn which species and varieties will succeed under cultivation; also to afford material for botanical studies. The collection there is being augmented every year and in the number of species and varieties growing there, in facilities for the examinaton of specimens, and in general arrangement, it compares very favourably with other botanic gardens in America.

Cover Crops.—Orchard cover crops have received much attention at the Central Experimental Farm, as it is believed that they play an important part in successful fruit culture. Among the plants which have been recently tested for this purpose the hairy vetch and English horse-bean are the most promising. The vetch makes a strong growth in autumn and makes a good covering for the ground in winter, and adds much nitrogen to the soil. The horse-bean grows until near winter and stands up during the winter and catches the snow which is so necessary in orchards to protect the roots of trees. It also adds nitrogen to the soil.

ENTOMOLOGICAL AND BOTANICAL DIVISION.

The work of this division has been carried on in much the same directions as in previous years. The division is now being recognized throughout the country as a source of reliable information concerning the habits of insects injurious to crops, or with regard to those species which are nature's restraint upon the undue increase of these enemies of the farmer and fruit-grower. Likewise many inquiries have been received concerning native plants and their suitability for cultivation, or as to the best way to eradicate those kinds which are, or are likely to become, agricultural pests. The poisonous weeds on the stock ranges have been made a special subject of investigation.

I have been glad to arrange for the entomologist and botanist to attend meetings and deliver addresses on subjects connected with the investigations carried on in his department in many parts of the Dominion. Series of meetings were held in the maritime provinces and the North-west Territories, and many addresses have been delivered at meetings of agricultural societies, farmers' institutes and horticultural societies.

The testing of fodder plants of all kinds has been continued at the Central Experimental Farm, and much correspondence has been carried on with farmers on this important subject.

Collections.—The collections of plants and insects at the Central Experimental Farm have been largely increased in all orders during the past year, many additions to the herbarium and cabinets having been made from collections of previous years, which have been mounted and placed in the cases where they are now available for easy reference, and where they have been made use of by many students who have visited the division. The great interest lately shown in weeds of the farm, and a fuller appreciation of the value of the clean seed, have caused much inquiry concerning weed seeds in the crop seeds purchased or saved by farmers for seeding. The large collection of weed seeds in the division has enabled the officers in all instances to report promptly on samples sent in, and give advice as to the real value of the samples submitted.

The Argenteuil Sand-hill.—A large and increasing tract of drifting sand, near Lachute, in the province of Quebec, has for many years, like others of a similar nature, been a menace to farmers of the districts where they occur. With a view of learning whether any practical steps could be taken to combat the encroachments of the sand, I instructed the entomologist and botanist to visit the Lachute locality and report to me if any practical measures could be adopted to control this nuisance and what could best be done to assist the farmers living around the margins of these shifting areas. Some steps have already been taken, and roots of the valuable beach grass which has been already largely used for this purpose in different parts of the world, have been distributed, as well as young trees of suitable kinds and cuttings of willows and poplars. These have all been gladly planted by the farmers who have themselves done much under the circumstances and with very satisfactory results. Next season, further efforts will be made of a similar nature, and it seems possible that with energetic effort for a few years much of this area which was formerly fertile farming land may be reclaimed.

Insect Enemies.—The entomologist and botanist reports that on the whole the season of 1904 was not marked by the occurrence of any serious plague of insects. Of those kinds of insect enemies which have most demanded the attention of the division and concerning which the entomological branch was able to disseminate useful information, the following may be referred to :—

Cereal Crops.—Grain crops, on the whole, have been very free from injury by insects. The only outbreak of importance was a reappearance of the Wheat Midge in the rich lands of the Fraser River valley, in British Columbia. The occurrence was very restricted in area, but the loss in the attacked fields was serious, and advice has been given by which, it is hoped, the increase of this enemy of the wheat crop will be prevented. A satisfactory feature of the year was the practical disappearance of some of the regularly-occurring enemies of grain crops. The Hessian Fly was reported only from one locality, in Prince Edward Island, and the loss from this insect was inappreciable, while a few years ago it caused many wheat-growers to take up other lines of profitable use for their land. A similar satisfactory state of affairs

prevailed with regard to the Wheat-stem Maggot and Locusts in the west. The Pea Weevil did less harm in 1904 than for many years previously, and, as a consequence, many growers who, this season, for fear of the Pea Weevil, had almost relinquished the cultivation of this desirable pulse, will next year put in a much larger area to it. The entomologist is urging the great advisability of care being taken by farmers to treat all seed before sowing, as this is the surest way of keeping down the numbers of the weevil.

The Grain Aphis was again abundant in some parts of the North-west Territories, but does not appear to have done very much harm.

Rust.—The crop pest which probably affected the output of the grain fields of the west to the largest extent was Rust, of which a sudden epidemic at the end of August injured wheat and oats considerably. This was an almost unprecedented occurrence in the prairie provinces, and, owing to the exceptionally late backward season, the grain plants were still sufficiently green for harm to be done by the parasite during the dull wet weather which set in before harvest, and which is so unusual in Manitoba and the North-west Territories.

Fruit Crops—The San José Scale.—The investigation of remedies for this most pernicious insect have been continued with satisfactory results. The Oregon Lime and Sulphur Wash has been extensively tested in the district infested by the scale, and good, clean crops of fruit have been secured, while at the same time the numbers of the scale have been materially reduced in treated orchards. Experiments have also shown that a useful wash may be made by reducing the sulphur in this wash, by mixing it with fresh lime and slaking with a solution of caustic soda. This method obviates the necessity of boiling the wash for two hours, a tedious and unpleasant operation.

Apple Maggot.—A destructive enemy of the apple, which on only two previous occasions has been recorded as injurious in Canada, wrought considerable destruction in the Fameuse crop, at Como, in the province of Quebec. It had appeared in some numbers in 1903, but during the past season was much more abundant. Means have been adopted to make the best remedies known.

Plum-leaf Sawfly.—An enemy of the plum, not of very great importance, but requiring attention, is a sawfly, the larva of which attacks plum leaves in autumn. This is *Dimorphopteryx pinguis*, and has been rather abundant at Ottawa during the months of August and September for some years. The life history of this insect has been fully worked out.

Strawberry Weevil.—A troublesome pest of the strawberry, *Anthonomus signatus*, which destroys the flower buds before they open, did some harm in western Ontario.

Root Crops and Vegetables—Cutworms.—Several species of Cutworms were complained of in different parts of the Dominion; the worst attacks were in Nova Scotia and New Brunswick. The poisoned-bran remedy was tried by many, as advised by the entomologist, and invariably gave satisfaction.

Root Maggots.—The destructive Root Maggots of onions, cabbages and radishes were abundant in many districts. An investigation of remedies was undertaken and will be continued next year. For small areas, cheap cheese-cloth coverings gave perfect immunity, and better and earlier crops of the above-named plants were secured.

CHEMISTRY DIVISION.

As in past years, this branch of the experimental farms work has rendered important and valuable assistance to Canadian agriculture by the prosecution of research in matters of more or less general interest to farmers, and by the dissemination of information by correspondence, lectures and bulletins. It would seem evident, from the increasing correspondence of the division and the large number of samples of an agricultural nature forwarded to the laboratory for examination, that there is a growing desire on the part of the Canadian farmer to benefit by the work of the chemist.

Among the more important of the numerous investigations that have engaged the attention of the chemist and his staff, during the year 1903-04, brief mention may be made of the following:—

Soils.—The examination of virgin soils representative of large areas of as yet unoccupied, or but partially occupied, lands, has been continued. These include soils from various districts in British Columbia, the North-west Territories and New Ontario. Detailed accounts of these appear in the report of the experimental farms for the current year. As far as is practicable, deductions have been made from the analytical data respecting the suitability of these lands for various crops, and information given as to the most economical methods for maintaining and increasing their fertility.

The Maintenance of Fertility through the Growth of Legumes.—Further experiments have been carefully conducted in this important research. They corroborate previous results in showing that in this class of plants (the clovers, &c.) we have the means of readily and cheaply enriching the soil in organic matter (humus) and nitrogen—the former improving the general tilth, and the latter becoming, by nitrification, a valuable source of food for subsequent crops. Practical experience throughout the length and breadth of Canada is year by year bearing favourable testimony to this means of increasing the soil's productiveness. It, undoubtedly, is the only method giving results at all comparable to those obtained from the use of farm manures. Trials have also been made with the new cultures of the nitrogen-assimilating bacteria recently prepared by the Department of Agriculture, Washington, D.C., U.S. The results can only be given as fairly successful, and further work must be done before anything definite can be said as to the practical utility of this new culture.

Soil Moisture Investigations.—The fourth season's work towards ascertaining the effect of various cover crops, cultivation, &c., upon the moisture content of orchard soils, has been brought to a close, furnishing information that will prove of service in orchard management. These investigations have been conducted on the experimental farms at Ottawa and Nappan, and include trials with oats, buckwheat, pease, hairy

vetch, soja beans and horse beans, as compared with clean culture. Much attention has been paid of late to soil management by orchardists, and although the treatment must necessarily differ in detail according to locality, nature of soil, &c., the system that gives clean cultivation during the early part of the season followed by a leguminous crop is the one most widely adopted. The results obtained from the experiments of this division clearly show that in those localities where during the early part of the season there may be an insufficiency of moisture for the trees' growth, the orchard soil should be given clean cultivation, say, till July 1. A cover crop should then be sown. This will serve to enrich the land, hasten the ripening of the wood and furnish protection to the roots during the ensuing winter.

Fodder Plants and Feeding Stuffs.—Valuable additions have been made to our knowledge of the relative values of feeding materials by the analysis of the various farm roots, fodder corn, certain mixed ensilages, &c. There has also been examined a considerable number of milling by-products, proprietary cattle foods, and the so-called stock and condimental foods now upon the Canadian market.

The feeding value of the straw and grain from rusted wheat—a matter of some importance this year to farmers in Manitoba—has been determined.

The composition of Emmer and Spelt, varieties of wheat now widely exploited for feeding purposes, has been ascertained, the results appearing as an appendix to Bulletin No. 45, issued during the past year.

In addition to detailed accounts of the aforementioned investigations, the report of this division for the current year will be found to contain analyses of certain new insecticides and fungicides, of about one hundred well waters from farm homesteads and creameries, and of a number of samples of wood ashes, bone, fish refuse, and other materials of a fertilizing value.

CEREAL BREEDING AND EXPERIMENTATION DIVISION.

The establishment of this as a separate division of the work of the experimental farms has made it possible to greatly enlarge the scope of the investigations which are being carried on, and to introduce some new features of much practical value.

Breeding New Cereals.—Several hundred new varieties of cereals (principally wheat) have been originated in this division during the past year. From among these it is expected that some very valuable sorts for general cultivation will be available after a few years, when the different types have been fixed by careful selection.

The more important of the older cross-bred sorts, produced at the experimental farms, have been thoroughly re-selected in order to bring them, as far as possible, to a condition of absolute uniformity. Many new strains of special merit have also been obtained by the selection of heads or plants exhibiting unusual excellence. It is believed that in this way a considerable improvement has already been made upon the varieties from which the selections were made, especially in regard to earliness in ripening and quality. Good progress has also been made in the purification of some of the most important standard varieties of grain which are now in general cultivation

in a more or less mixed and unsatisfactory condition. All of these new selections are being propagated as rapidly as possible, and the best of them will be introduced to the public as soon as a sufficient quantity of seed has been obtained.

The work of cross-fertilising in cereals has been continued as usual, a number of interesting crosses having been effected.

Quality of Wheat.—In view of the great importance of maintaining the high quality of Canadian wheat as grown on the great plains and elsewhere, and the desirability of improving this cereal as grown in some of the older sections of the Dominion, a thorough study of the varieties of wheat now generally cultivated seemed necessary. I, therefore, authorized this year, the purchase of a small roller-process flour mill for experimental purposes. This mill has now been in use for some time and has been found admirably adapted for grinding very small quantities of wheat. An investigation into the quality of the different varieties of wheat as grown in the various climates and soils of the Dominion is now being carried on, the flour produced by the small mill being subjected to chemical and mechanical analysis and to baking tests. The results of this work will be given to the public as soon as possible, with a view to encouraging the growing (for flour making) of only those sorts of wheat which will give a product of high quality.

The numerous cross-bred varieties of wheat produced at the experimental farms are also being tested in the same way so that only those of known excellence will be retained for propagation and distribution.

Comparative Test Plots.—The comparative tests of standard and new sorts of cereals, field roots and fodder corn have been continued as usual, and valuable information has been gained in regard to the relative productiveness, earliness and other characteristics of the different varieties under test.

Emmer and Spelt.—During the past year there was prepared, by this division, Bulletin No. 45 of the experimental farm series, describing the different varieties of emmer and spelt and discussing their value and uses as farm crops.

POULTRY DIVISION.

In this department experimental work in connection with egg production in winter and the superior quality of poultry in early summer was continued. Careful note was taken of the rations best calculated to bring about the greatest egg production at the cheapest cost. Experience so far gained goes to show that variety in the composition of rations is attended with beneficial results. It has also been learned that fresh air and exercise are factors in securing strong germs in the eggs laid by hens in early spring time, and which hens have also been winter layers. The necessity of having breeding stock of undoubted constitutional vitality has been shown with no uncertain sound. During the year the following new varieties were added to those already in stock, viz.: Silver Laced Wyandottes, Light Brahmas, and Silver Spangled and Black Hamburgs. With the addition of these fowls, there are now fifteen of the best known varieties of the Standard breeds in the department.

During last spring and early summer a large number of chickens were hatched by incubators and reared in brooders. In several instances most satisfactory results were obtained by means of artificial incubation. Several broods of chickens were also hatched by hens. In combination with the experience of previous years, that of the past season strengthens the opinion that where a number of chickens are required—early in the season—at one hatching, so as to be of uniform age, artificial means are preferable mediums of hatching and rearing the chickens.

During the season a temporary incubator room was erected and in it were placed five hot-air and one hot-water incubators, thus affording opportunity to compare the two systems. Several colony houses were also erected, as also a model poultry house with scratching shed attachment. This house is so arranged that the cleaning of the platform, collecting of the eggs and feeding of cut bone and mash may be done from the passage way and disturbance of the laying stock, during the winter season, so avoided.

Other useful and interesting experimental work was carried on, particulars of which will be found in the annual report of this branch.

BRANCH FARMS.

EXPERIMENTAL FARM FOR THE MARITIME PROVINCES.

At the experimental farm for the maritime provinces, located at Nappan, N.S., much useful experimental work has been continued. In the dairy branch comparative tests have been carried on to ascertain the relative merits of the individual cows composing the herd, to find out which gives the largest quantity of milk and butter fat for the feed consumed. Some further tests have also been made in the feeding of steers with the view of determining as far as possible how good beef can be produced at the least cost, also the most profitable age at which to finish off the animals for market. Experiments have also been conducted in the feeding of swine to ascertain the effect of different foods in the rapidity of growth of the animals under test.

Comparative trials have been continued with many varieties of oats, barley, spring wheat and pease to learn which are the more productive and profitable. Tests have been made with different sorts of buckwheat, also with crops of mixed grain. Different sorts of Indian corn have been tried to find what varieties give the largest weight of ensilage of the best quality. This crop has been grown in hills and rows at the usual distance, also in rows at different distances apart to find which method gives the larger crop. Some experiments have also been conducted on this crop with fertilizers. Tests have also been made with different sorts of turnips, mangels, carrots and potatoes, and much useful information gained.

Experiments have also been carried on with clover, flax, horse-beans and soja-beans.

In the horticultural division, good progress is being made. The apple orchards are doing well, and the trees are bearing good crops of fruit of excellent quality. Other

varieties of large fruits have given light yields. Small fruits on account of the drought gave an unsatisfactory return. Many sorts of garden vegetables were tried and useful information gained as to those which were the earliest, best and most productive, the particulars of which will be found in the annual report of the experimental farms.

EXPERIMENTAL FARM FOR MANITOBA.

Since wheat is the most important crop grown in Manitoba, much attention has been paid at the Brandon farm to this cereal. Experiments have been carried on with a great many different sorts of wheat with the hope of finding varieties earlier in ripening and equal in quality and productiveness to the best of the standard sorts now grown. Trials have been made with selected and unselected seed, with different methods of preparing the soil, in testing the effect of sowing with different sorts of drills; in the use of barn-yard manure and artificial fertilizers, also with remedies to prevent smut in wheat.

Many tests have also been conducted with spelt and emmer, oats, barley, pease, Indian corn, turnips, mangels, carrots, sugar beets and potatoes, with useful results.

Trials have also been made with different kinds of grasses, clovers, millets, horse-beans and sunflowers and much information gained.

Some steers were fed to determine the relative value as coarse fodder of brome hay and fodder corn cured outside in stook. Some feeding experiments with swine have also been conducted to gain information as to the usefulness of common emmer when compared with a mixture of wheat, barley and oats for fattening purposes. Experiments have also been conducted with poultry and bees.

Many further tests have been made with cross-bred and seedling apples and some useful new sorts have been fruited which promise well. Quite a large crop of the different varieties of *Pyrus baccata* and *Pyrus prunifolia* was grown with some also of the cross-bred sorts. Several good seedlings of Martha crab which appear to be quite hardy have been originated at this farm; some nice fruit was also borne on some of the *Pyrus baccata* trees which had been top-grafted with the Transcendant crab.

A number of plum trees have fruited during the past season, which were grown from selected fruit of wild plum trees found in Southern Manitoba. Most of these produced fruit which ripened early enough to escape injury from frost, and in quality they were very acceptable. Small fruits gave a fair crop and ripened well.

EXPERIMENTAL FARM FOR THE NORTH-WEST TERRITORIES.

This experimental farm usually surpasses all the others in its large crops of wheat, and the past year has been no exception in this respect, some of the varieties in field culture having exceeded 40 bushels per acre. The grain is also of good quality. Similar tests to those conducted at Brandon with wheat have been carried on here also, especially with regard to the earlier ripening habit of some of the varieties under trial. Some of the cross-bred sorts have ripened from five or six to ten or twelve days

earlier than Red Fife. If this characteristic proves to be fixed, such gains in earliness will provide for a considerable extension northward of the wheat-growing area in Canada. Much attention is paid here to the summer-fallowing of land. Care is also taken to treat the seed before sowing with a solution of copper sulphate, so that the quality of the crop may not be injured by smut.

The uniform trial plots of oats, barley, pease, Indian corn, turnips, mangels, carrots, sugar-beets and potatoes have again been grown, with, in most instances, excellent and heavy returns. Experiments have also been continued in the rotation of crops, and tests have been made with plots of fall and spring rye, flax, canary grass, tares, millets, horse beans and soja beans.

The growing of Brome grass has gone beyond the experimental stage at Indian Head, where it has been under test for the past fifteen years, and where large fields are now annually grown for hay and seed. Western rye grass has also succeeded well, and last year both alfalfa and timothy gave fair returns.

The displays of annual and perennial flowers have been unusually brilliant during the past season and have attracted much attention from visitors. The shelter belts and avenues of trees, the hedges and the plantations of ornamental trees and shrubs have grown well.

The orchards of Siberian crabs and cross-bred apples were considerably injured last winter by unusually severe depredations by rabbits, which devoured the bark of many of the trees to near the ground. This will delay the fruiting of some of these specimens for two or three years. Notwithstanding this inquiry, considerable quantities of these fruits were produced. These orchards are becoming more interesting each year.

Most of the small fruits have borne well, and the crops have matured.

A large number of different sorts of vegetables have been tested to gain information as to their suitability to the climate, and much information has been gained, which will be disseminated among farmers in the annual report of the farms.

A feeding test of steers was made to determine the effect of turning one-half of the number out each day for two hours, and comparing these with the other half kept closely confined in the stable. The steers were all fed alike. The result was slightly in favour of the animals kept in the stable.

THE EXPERIMENTAL FARM FOR BRITISH COLUMBIA.

The experimental farm for this province, located at Agassiz, 70 miles east of Vancouver, continues to render good service to the country by testing from year to year the relative productiveness, quality and time of ripening of the many products which can be grown with more or less success in this favourable climate. Experiments have been continued with many important farm crops, including oats, spring wheat, barley and pease, most of which have given good results. As at the other

farms, the element of individual productiveness in varieties asserts itself as clearly here as elsewhere, and the demonstrations made as to which of these several useful cereals give the best and most productive crops are of great value to the farmer, serving as a guide to him in his work, furnishing information which it would be impracticable for him to obtain for himself.

Many varieties of Indian corn have been tested to find out those most suitable for ensilage purposes. These have been grown both in rows and hills, and also at different distances between the rows. Many sorts of turnips, mangels, carrots, sugar beets and potatoes have also been tried. A number of fodder plants have been under test, including grasses, clovers, millets, cow peas, velvet flax, sunflowers and horse beans; experiments have also been conducted with flax and sunflowers. Most of the leading varieties of vegetables have been under trial, and particulars as to their relative time of ripening, productiveness and quality are given in the annual report of the experimental farms.

In the large collection of fruit trees which has been brought together from different parts of the world in the orchards at Agassiz, many new sorts are now fruiting every year. Careful descriptions of these are made by the superintendent as they come into bearing, and are published annually in his report. The last report contains descriptions of 49 apples, 21 pears, 10 plums and 3 cherries, all new to this climate. The information thus supplied to the fruit-growers of this province is of great value and a practical guide to them in their work. A large number of small fruits have also been tested and similar useful information supplied.

The live stock on this farm consists of Durham or Shorthorn cattle, Dorset horned sheep, Berkshire and Yorkshire swine, and several breeds of poultry. Additional animals have been supplied in each of these classes during the past year, so as to keep the quality of the stock up to the desired degree of excellence. The surplus young animals are sold to the farmers in different districts of the province for the improvement of stock.

GENERAL CROPS.

During the season of 1904 the crops in most parts of the Dominion have been encouraging. In the middle and western provinces notwithstanding that the season has been drier than usual, farmers have had favourable returns, but in the maritime provinces, owing to the severe drought which prevailed during the greater part of the growing season, most of the crops have been below the average.

ONTARIO.

In this province most of the crops have been good. Hay which is relatively a very important crop has given good average results and in some localities the crop has been unusually heavy.

Fall wheat has given in some districts a good average crop of plump and satisfactory grain, while in other localities the crop has been very light and where rust has

prevailed, the grain has been more or less shrunken. The spring wheat has also been of good quality and the yield nearly an average one. Oats which now occupy in Ontario an area larger than that of all the other cereals combined have given an excellent crop. barley has also produced very satisfactory returns. The pea crop has been somewhat reduced in acreage owing to the ravages of the pea weevil, the yield however has been satisfactory, and the injury from weevil was comparatively slight.

Indian corn was late sown owing to cool wet weather, the seed also was generally of poor quality and did not germinate well, hence in many cases there was a poor stand. The season was not hot enough to produce the best results with this crop, nevertheless in many districts a satisfactory harvest was obtained.

Potatoes generally have yielded well but have been considerably affected by rot. Wherever the vines have been sprayed at the proper time with Bordeaux mixture, rot has been prevented. Field roots notwithstanding that they were sown later than usual have given fair average crops.

Pastures have been generally good, the dairy industry has been well sustained and the exports of cheese and butter have been very large. The swine industry is also advancing and increased quantities have been available for the home and export markets.

Small fruits have given satisfactory results. Plums which gave so heavy a crop last year have yielded lightly this season. Pears are increasing in value and importance and are giving good returns. The crop of peaches has been below the average, and owing to the cool season, the later varieties of grapes did not ripen well.

Apples in most districts have yielded well, but in a few localities the crop has been light. Owing to an unusually large apple crop in Great Britain, prices for early ripening varieties have ruled unusually low, and the returns from some shipments have been disappointing. The quality of the fruit this year is good and there is every prospect that the later maturing sorts which form the larger part of the fruit exports from Canada will command good prices.

QUEBEC.

In this province hay which is perhaps the most important of all crops, has given in most localities highly satisfactory returns well above the average.

Spring wheat and barley have in general given a full average crop, while oats which in Quebec stand second only to hay in importance have given in most localities more than an average yield. Indian corn owing to late sowing and deficient vitality in the seed has given less than an average return, while vetches, clovers and other fodder crops have done well.

The potato crop has been good, but the injury from rot is considerable. Spraying at the proper time with Bordeaux mixture invariably arrests this disease. Field roots have given good returns and their growth might be extended with advantage in

this province. Buckwheat has given about an average yield, and the crop of tobacco has been fairly satisfactory.

The pastures have furnished abundant food for dairy animals and other stock. The quantity of cheese and butter produced has increased but prices have ruled somewhat lower than last year. The stock industry is progressing well, and while the animals are increasing in number they are also improving in quality much more attention is also paid to the breeding of horses.

An increasing interest is manifested in fruit growing and many new orchards have been planted. Those of sufficient age have borne well and the quality of the fruit has been quite satisfactory. In those districts where plums are grown, the crops have been good. Small fruits also gave generous returns.

THE MARITIME PROVINCES.

In these provinces the conditions for crop growing have not been so favourable as in the other parts of the Dominion. The early part of the season was cold and wet and seeding was much delayed. Shortly after the crops were up a drought occurred when scarcely any rain fell for nearly two months. Subsequent growth was rapid, but the remainder of the season was not long enough or warm enough to make up for the early loss in growth.

The yield of hay which is a most important crop in these provinces was considerably less than the average, variously estimated at from 15 to 25 per cent. Pastures also have been unusually poor.

The crops of oats, spring wheat and barley were all below the average. The quality of the grain, however, has been good. Indian corn was not a heavy crop The seed did not germinate well, which made the fields uneven and in many instances it was not well matured when frost came. Buckwheat has given fair returns.

The apple crop has been large, and the quality of the fruit good. The apple industry is attaining large proportions especially in Nova Scotia. A large number of young orchards are being planted in each of these provinces. The dry summer has been unfavourable for the crop of small fruits which has fallen below the average.

MANITOBA.

In this province the growing of cereals, especially wheat is paramount, and claims the larger share of the farmer's attention. The returns from the harvest this year are said to be below the average, due partly to dry weather in the summer and partly to rust, which in some limited areas did a considerable amount of injury. Favourable weather prevailed during the greater part of the harvesting period, and also during the time of threshing and the grain was well saved. Owing to the dry weather the growth of straw was shorter than usual which somewhat reduced the cost of harvesting. Not much of the wheat will grade No. 1, although the quality is good, but the higher price paid this season will more than make up for the somewhat reduced yield and the

slightly lower grade. The area under cereals in Manitoba is said to have been considerably increased.

Oats and barley have given fairly heavy returns. Indian corn grown for ensilage has also done well. Potatoes have given unusually large returns and the crops of field roots have been very satisfactory.

The dairy and stock interests are making good progress in Manitoba, although the pastures have been scarcely up to the average. The hay crop has been somewhat lighter than usual.

NORTH-WEST TERRITORIES.

The wheat crop in the Territories, although less in area than in Manitoba, has averaged a larger return. The dry weather injured the crop somewhat which resulted in a shorter growth of straw, but there was little or no rust and much of the grain produced was plump and good. The first autumn frost did not occur at Indian Head until the 11th of September, hence there has not been much injury from this cause. The high prices paid this year will give the farmers in the Territories large returns.

Oats, barley and pease have all done well and given crops above the average.

Potatoes have given heavy crops and the field roots have given fair returns.

The crop of hay was about medium and pastures suffered during the dry period in summer, but later in the season the growth of grass was good. Stockmen in the Territories are said to have had a prosperous season.

BRITISH COLUMBIA.

The season as a rule throughout this province was unusually dry. This did not materially injure the farms in the coast climate where the usual rainfall is very heavy, but it reduced the crops in the interior where the rainfall is scanty and irrigation is not practised. On irrigated lands the crops were good.

Hay, in most parts of the coast climate, was an exceptionally heavy crop. Clovers succeeded remarkably well and gave in most instances two good crops and in some cases three.

Oats, spring wheat, barley and pease have all given satisfactory returns except in some of the drier districts referred to and the grain is plump and good.

Potatoes have given somewhat less than an average yield, but field roots in most instances have given good returns. Indian corn has also grown well, but was uneven owing to faulty germination of the seed.

Hops have given a large crop and the quality is very good. Most of the growers in British Columbia find a good market for their product in Great Britain.

Apples have given an average yield, and in some orchards in the interior the crop has been heavy. The fruit was of excellent quality and commanded good prices. Pears

also have produced fair crops and given good returns. A large crop of plums was harvested, and were less injured by rot than usual; a large proportion of these found a ready market in the mining districts in British Columbia and in the North-west. Cherries also in some districts were a satisfactory crop.

Small fruits yielded abundantly, blackberries being especially productive.

HEALTH OF ANIMALS BRANCH.

Considerable progress has been made in the reorganization of the health of animals branch of my department.

New quarantine regulations, providing for the more effective inspection and quarantine of imported animals, have been issued.

Provision has also been made for the erection of new animals quarantine stations at Halifax and St. John, at the former place by purchase of a suitable parcel of ground, and at the latter by securing a lease of an equally suitable property from the Department of Railways and Canals.

At both of these ports it will now be possible to directly transfer imported animals by rail from the ship to the quarantine station.

A number of new quarantine stations have also been established along the boundary between Canada and the United States, as I have found it advisable to adopt quarantine measures in the case of certain classes of animals imported from that country.

Owing to the prevalence of glanders, especially in the North-west Territories and in some parts of Ontario and Quebec, and the appearance of another serious disease of horses in Alberta, I found it necessary to introduce an amendment to the 'Animal Contagious Diseases Act,' authorizing payment, in certain cases, of compensation for horses destroyed. I anticipate great benefit from this change of policy, as it will enable the officers of this branch of my department to deal with outbreaks of disease in a much more thorough and effective manner than has hitherto been possible.

Mange having continued to affect to á serious extent the cattle of Southern Alberta and a considerable portion of Assiniboia, a comprehensive policy providing for their general and simultaneous treatment was adopted in the early part of last summer. This policy, which has involved a considerable extra expenditure owing to the necessity for thorough organization extending over a large area, has been carried out with a gratifying measure of success, nearly 500,000 head having been subjected to treatment during the months of September and October.

As above mentioned, a new disease known as dourine, or 'Maladie du Coit' has made its appearance among the horses in Southern Alberta. This disease was originally imported from Europe to the United States in 1882, and having since existed in various parts of that country, has doubtless been introduced among the large importations which have accompanied the recent influx of settlers. Active steps have been

taken to prevent its spread, and at the present time a number of horses are isolated in a temporary quarantine at Lethbridge, Alberta, where they are being kept under close observation with a view to the destruction of all individuals developing unmistakable symptoms. As the disease is not thoroughly understood, especially in America, where climatic and hygienic conditions are not favourable to its active development, it has been thought better to follow this course than one of indiscriminate slaughter.

The results so far of the investigation into the nature and cause of 'Pictou Cattle Disease,' which is being conducted at the recently established experiment station near Antigonish, N.S., encourage me to hope that this malady may soon be shown to be due to local causes instead of being, as has long been feared, of a contagious nature.

The investigation being conducted at Winnipeg into the nature and causes of the disease of horses known as 'Swamp Fever' is still being carried on, but owing to lack of material the progress made cannot be considered satisfactory. The disease, however, is not nearly so prevalent as in former years, a result probably due to the settlement and drainage of large areas of swamp land.

The biological laboratory recently established at the experimental farm, is demonstrating its usefulness in several directions. Many pathological specimens forwarded by our inspectors and others, have been examined and doubts as to the nature of outbreaks of disease in various parts of the country have thus been set at rest.

Among other matters, the pathologist has examined a number of cases of lump jaw, with the result that he has been able to show that many animals supposed to be suffering from actinomycosis are in reality affected with actinobacillosis, a disease similar to the former malady in its external manifestations, but differing widely in pathological character.

The mallein used by the department in diagnosing and dealing with glanders, is now produced at this institution instead of being purchased from manufacturers as formerly. It is hoped that in the near future, a number of similar preparations will also be produced.

The results of the active policy now followed in dealing with hog cholera have been most gratifying, the number of outbreaks reported during the present year being considerably less than one half of those for the corresponding period immediately preceding. With the exception of a few minor outbreaks in British Columbia, the disease has been practically confined to the quarantined area in south-western Ontario, where the efforts of our inspectors have been instrumental in lessening to a marked degree the prevalence of the disease.

The system now in force of following up and thoroughly cleansing and disinfecting all stock cars conveying hogs from the quarantined area is, I am satisfied, responsible in a marked degree for the noteworthy diminution of outbreaks in other districts.

The application of similar rules to all cars conveying animals from the mange-infected area in the North-west Territories and the providing of separate yards for

their accommodation will, I am convinced, be found equally effective in preventing the spread of that troublesome disease. It has long been contended by western stock men that mange was being constantly introduced among their herds by the importation of stockers from Manitoba and Ontario, in spite of the fact that this disease does not exist in these provinces, the fact being that the young animals contracted mange through being conveyed in cars and held in yards previously occupied by animals shipped from the infected area.

The new regulations now in force are calculated to put an end to this unsatisfactory condition of affairs.

There has been, during this year, a gratifying diminution in the number of outbreaks of anthrax and black quarter. The dissemination of useful information regarding these diseases, particularly as to the thorough destruction of carcasses has been of great benefit.

Tuberculosis also appears to be much less prevalent than in former years.

The returns with reference to sheep scab are most encouraging, very few outbreaks having been reported, although the machinery for their detection is more effective than was formerly the case. The policy which was adopted last year of carefully watching the large live stock markets has been fully justified by results, a number of outbreaks of disease having been detected and dealt with through information obtained in this way by our inspectors.

The export to Europe of cattle and sheep has been carefully guarded, a distinct improvement having been made in this direction by the adoption of a policy of carefully examining all stock shipped from Canada viâ United States seaports.

ARCHIVES BRANCH.

For some years past, the government has had under consideration a scheme for centralizing the records of the Crown. In 1903, an Order in Council was passed, by which it was provided that all papers deposited in the various departments, affecting the earlier history of the country, should be transferred to a central office and placed in the custody of an individual, to be named the Dominion Archivist and Keeper of the Records. The papers to be thus transferred include:

1. Everything in the archives branch of the Department of Agriculture.

2. Everything in the records branch of the Department of the Secretary of State, other than departmental files and letter-books of later date than June 30, 1867, lodged there for convenience.

3. Everything in the Privy Council Office of date anterior to July 1, 1867.

4. Correspondence of the Provincial Secretary of Canada in the Department of Finance and elsewhere.

5. Papers in the Militia Department, or elsewhere, having reference to the War of 1812 and the Rebellion of 1837.

6. Documents bearing upon the early history of the Rideau and Welland canals, whether in the Department of Railways and Canals, or in the Department of the Interior or elsewhere.

7. Documents in the Department of Justice, or elsewhere, relating to the risings in the North-west, and also those touching the Fenian Raids.

8. Bound manuscript volumes containing reports of Indian commissioners at Albany and elsewhere, dating from 1722, now in the Department of Indian Affairs; also the original surrenders from the Indian tribes.

9. Papers in the Department of Marine and Fisheries, relating to the Behring sea seal fisheries and other international questions, as the subjects to which they relate are disposed of.

The archivist will, therefore, become the custodian of records which have hitherto been under the control of the various departments.

An estimate of the space required for the reception of these records was obtained, and it was found that a building affording a floor space of 20,000 square feet would be necessary. The government thereupon decided to erect a suitable fire-proof building for the preservation of the archives, and the work has been commenced.

In the meantime, it has been found necessary to remove about 400,000 records from the Department of the Secretary of State, and several cases from other offices, to a temporary building. The total number of records to be deposited in the central office will be very large. Many of them are of special value and absolutely necessary for the correct interpretation of our history. The work of arranging and classifying these records will entail considerable labour, and it will be desirable to make provision for means to carry on the work with reasonable promptitude.

The Archives Branch has been placed under the charge of A. G. Doughty, Fellow of the Royal Historical Society, Doctor of Letters of the University of Laval, and formerly joint librarian of the legislature of the province of Quebec. For many years Dr. Doughty has been actively engaged in research, and has kept in touch with the custodians of records in England and in foreign countries.

Since his appointment the archivist has made good progress with the work of reorganization. A general index to the contents of all the volumes at present is in the course of preparation, and will be completed within a few months. Further details of the work undertaken, and of the condition of the records, are to be found in the Archivist's Report for the present year. I am pleased to announce that so far his efforts have been successful, and that he has secured for our archives about 400 volumes of original papers, consisting of despatches from the Secretary of State in England, to the Governors in Canada, between 1790 to 1840 ; correspondence between the Governors and the lieutenant governors of the provinces, and many cases of semi-private documents bearing upon Canadian history.

During the past year the department has received the following volumes :

FROM LONDON.

Nova Scotia—

Despatches to Governors and Acting Governors, 1750-1763.
Expedition to Louisburg, 1745-1750.
List of Emigrants, 1748-1749.

Cape Breton—

Despatches to Governors, 1784-1790.
Minutes of Executive Council, 1785-1798.

Prince Edward Island—

Journals of the House of Assembly, 1776-1801.
Journals of the Legislative Council, 1773-1801.
Minutes of the Executive Council, 1784-1798.

From Paris—

Canada Correspondance Générale, 2ème Séries.
Domaine d'Occident, 1739-1748.
Mémoire du Roy et Lettres Ecrites, 1709.
Inventaire des Ecrits, 1718.
Arrêts et Décisions, 1677-1731.
Etat Civil, Ile St. Jean, 1721-1751.
Recensement de l'Acadie, 1671-1752.

III.—PATENTS OF INVENTION.

The following comparative tables show the transactions of the Patent Branch of the Department of Agriculture, from November 1, 1894, to October 31, 1904 :—

Years.	Applications for Patents.	Patents and Certificates Granted.			Caveats.	Assignments of Patents.
		Patents.	Certificates.	Total.		
1894	3,291	2,756	462	3,218	301	1,445
1895	3,387	3,074	422	3,496	343	1,550
1896	3,728	3,488	413	3,901	306	1,420
1897	4,300	4,013	284	4,297	377	1,551
1898	4,200	3,611	262	3,873	363	1,657
1899	4,305	3,151	412	3,563	311	1,467
1900	4,628	4,522	482	5,004	283	1,914
1901	4,817	4,766	551	5,317	302	2,323
1902	5,301	4,391	510	4,901	317	2,339
1903	5,912	5,673	432	6,105	328	2,384
1904	6,061	6,091	517	6,607	303	2,472

Detailed Statement, Patent Office Fees.

Years.	Patents.	Assign-ments.	Caveats.	Copies.	Subscrip-tion to 'Patent Record.'	Notices to Apply for Patent.	Sundries.	Total.
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
1894.....	73,061 77	3,142 74	1,793 40	764 07	347 21	1,449 80	123 57	80,682 56
1895.....	78,223 52	3,194 00	1,854 35	761 54	245 98	1,951 30	129 79	86,358 48
1896.....	85,060 61	3,130 56	1,790 65	898 27	420 60	2,245 79	57 04	93,532 52
1897.....	93,298 16	3,250 23	2,108 57	969 33	252 53	2,110 89	128 21	102,117 92
1898.....	91,176 44	3,641 90	1,935 74	706 50	266 44	1,463 10	172 73	99,361 95
1899.....	98,669 92	3,781 71	1,533 25	1,028 80	198 05	1,912 00	137 83	107,261 56
1900.....	104,848 96	4,255 40	1,405 00	932 54	552 71	1,742 70	115 15	113,852 46
1901.....	109,985 59	4,506 07	1,479 25	882 87	592 47	2,484 90	133 22	120,064 37
1902.....	119,766 43	5,079 20	1,565 35	1,112 59	327 95	1,883 00	162 30	129,896 82
1903.....	130,561 00	5,309 00	1,803 00	1,067 82	373 75	1,994 25	254 99	141,363 81
1904.....	134,676 47	5,831 10	1,660 44	1,201 08	391 75	1,827 25	308 01	145,896 10

The Patent Office fees received during the year ended October 31, show a surplus of $83,266.94 over the working expenses of the office as per subjoined table.

Receipts.	$ cts.	Expenditure.	$ cts.
Cash received.....	145,896 10	Salaries.....	42,315 50
Cash refunded.....	2,933 42	'Patent Record'.....	17,380 24
			59,695 74
		Receipts over expenditure.....	83,266 94
Net cash.....	142,962 68		142,962 68

The following is a table of the countries of residence of the patentees for the years named :—

Countries.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
Canada	661	707	740	756	710	601	707	744	654	794	837
England	177	179	215	266	261	205	254	256	239	248	310
United States	1,731	1,980	2,270	2,666	2,312	2,038	3,216	3,423	3,164	4,222	4,417
France	24	21	24	26	39	36	40	50	45	57	65
Germany	108	102	117	126	124	112	157	125	100	116	185
Other countries	55	85	122	173	165	159	148	168	189	236	277
Total	2,756	3,074	3,488	4,013	3,611	3,151	4,522	4,766	4,391	5,673	6,091

The Canadian patentees were distributed among the provinces of the Dominion as follows :—

Provinces.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.	1903.	1904.
Ontario	404	451	430	464	383	310	396	407	373	438	477
Quebec	162	177	201	178	171	160	164	185	148	194	171
New Brunswick	13	13	12	20	26	7	14	26	14	18	33
Nova Scotia	15	19	32	22	27	18	21	17	26	22	35
Prince Edward Island	2	6	2	2	4	8	1	0	1	2	1
Manitoba and the North-west Territories	38	18	28	36	45	50	42	52	40	64	61
British Columbia	27	23	35	34	54	48	69	57	52	56	59
Total	661	707	740	756	710	601	707	744	654	794	837

Patents issued to residents of Canada, with the ratio of population to each patent granted :—

Provinces.	Patents.	One to every
Brisish Columbia	59	3,028
Ontario	477	4,568
Manitoba and North-west Territories	61	7,654
Quebec	171	9,631
New Brunswick	33	10,034
Nova Scotia	35	13,131
Prince Edward Island	1	103,259
Total	837	

Statement of the number of patents issued under the Act of the session of 1892, 55-56 Vic., chap. 24, on which the fees are paid for periods of six, twelve or eighteen years, at the option of the patentee; and of patents on which certificates of payments of fees were attached after the issue of patents originally granted for periods of six and twelve years.

Years.	Periods for which the Fees were paid on first issue.			Patents on which Certificates were attached after issue.	
	6 years.	12 years	18 years	6 years.	12 years
1894 (12 months ended October 31)	2,701	9	46	.....	4
1895 " "	3,049	5	20	.....	.....
1896 " "	3,443	11	34	2	.....
1897 " "	3,981	8	24	15	3
1898 " "	3,586	3	22	176	9
1899 " "	3,125	3	23	291	13
1900 " "	4,489	4	29	366	21
1901 " "	4,719	8	39	408	31
1902 " "	4,362	2	27	412	39
1903 " "	5,630	2	41	405	27
1904 " "	6,059	9	23	493	24

The preceding tables show that there has been a large increase in the transactions of the Patent Office during the past year. The total revenue for the year ended October 31, 1904, was $145,896.10, exceeding all previous years; resulting in an in-

crease of $4,532.29 over the preceding year, and a surplus of $83,266.94 over the expenditure.

The total number of reports issued by the examiners during the year was 8,347.

Out of the total number of patents granted during the year, there were 4,417 issued to inventors resident in the United States, being over 74 per centum of the whole issue.

Patentees who are resident in foreign countries, continue to avail themselves of the privilege granted under section 8 of 'The Patent Act,' by giving notice of intention to apply for patents in Canada. The number of these notices registered during the year was 919, yielding a revenue of $1,827.25.

The 'Canadian Patent Office Record' continues to be published monthly. It contains a transcript, with drawings, of all claims of patents granted, dates of filing, dates of issue, and length of term for which fees have been paid; also names and residences of patentees, as well as containing a list of registered copyrights, trade marks and designs. This publication is of great and increasing value to all who are interested in patents, trade marks, copyrights and designs. It affords convenient and easy reference to the claims of all patents granted in Canada, and thus enables both inventors and the public to see exactly what is patented.

This publication is supplied to foreign patent offices, and is also sent without charge to the free libraries in Canada, and in foreign countries, with the object of diffusing in the public interest the information therein contained. The publication is also furnished to the public at $2 per annum, or 20 cents for single monthly numbers.

This branch of my department is indebted to the British and United States Patent Offices, for their weekly official reports.

I have again to direct the attention of patentees and their solicitors, to the necessity of remitting partial fees before the expiry of the six and twelve years' terms, otherwise the patents will cease and determine, the Commissioner not being vested with the discretionary power, under any circumstances, to revive them. A revival can only be secured by a private Act of Parliament, the obtaining of which entails considerable expense to the patentee. It may further be added that the Committee on Private Bills usually discourages applications of this kind, on the ground that no one should be denied the right of manufacturing, using or vending an invention which has become the property of the public. Exceptional cases may arise, however, in which the patentee or the holder of the patent may be justly entitled to relief from parliament.

It is in the interest of both the applicants and the office that great care should be taken by applicants and their attorneys in the preparation of the papers and drawings which are required by the rules and forms.

Since the Act of 1903, amending the Patent Act, came into force a very large number of applications have been received from patentees to have their patents made

subject to these conditions. In dealing with these applications the requirement of the law in regard to manufacture has been kept in mind. The applications which have been granted are those relating to patents for inventions such as the following : An art or process; improvements on a patented invention when both patents are not held by the same person; appliances or apparatus used in connection with railways, telegraph, telephone and lighting systems, and other works usually under the control of public or large private corporations, and which appliances or apparatus cannot be installed or constructed without the consent of such corporations; and certain inventions which are manufactured or constructed only to order, and are not, according to custom, carried in stock.

In dealing with applications for extensions of time to manufacture and import, the law is applied according to its strict and literal meaning, and the applications are granted only when the applicant has clearly established to the satisfaction of the office, by affidavit or solemn declaration, that the failure to manufacture or import is due to no fault of his, but to reasons beyond his control. Although these applications continue to be quite numerous, it is seldom that such a case is made out as warrants the granting of the application.

The regular work of this branch of my department during the year has been attended to with as much despatch as possible, and I am pleased to say that the number of applications unavoidably in arrears in the examiners' divisions has been greatly reduced.

IV.—COPYRIGHTS, TRADE MARKS, INDUSTRIAL DESIGNS AND TIMBER MARKS.

STATEMENT of fees received by the Copyright and Trade Marks Branch from November 1, 1903, to October 31, 1904.

Months.	Trade Marks.	Copyrights.	Designs.	Timber Marks.	Assignments.	Copies.	Total.
1903.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
November	1,213 75	93 00	35 00	6 00	18 00	6 00	1,371 75
December	1,400 00	192 00	55 00	8 00	14 00	21 50	1,690 50
1904.							
January	1,341 15	72 35	21 00	6 00	16 50	9 00	1,466 00
February	1,960 35	73 00	35 00	6 00	5 00	12 00	2,091 35
March	2,095 25	94 50	65 00		8 75	4 20	2,267 70
April	1,375 00	96 00	95 00	2 00	34 00	24 75	1,626 75
May	1,826 00	120 50	124 00	4 00	19 00	23 00	2,116 50
June	1,290 60	119 00	95 00		13 00	3 50	1,521 10
July	1,639 90	114 00	15 00	4 00	8 00	20 65	1,801 55
August	1,435 35	113 50	43 00	4 00	23 00	16 50	1,635 35
September	1,377 15	89 50	38 00	8 00	20 00	8 50	1,541 15
October	1,295 10	124 00	65 00		25 00	8 50	1,517 60
	18,249 60	1,301 35	686 00	48 00	204 25	158 10	20,647 30

The following table shows a comparative statement of the business of this branch from 1894 to October 31, 1904, inclusive :—

Year.	Letters Received.	Letters Sent.	Copyrights Registered	Certificates of Copyrights.	Trade Marks Registered	Certificates of Trade Marks.	Industrial Designs Registered	Certificates of Industrial Designs	Timber Marks Registered.	Certificates of Timber Marks.	Assignments Registered	Fees Received.
1894	1,882	2,720	546	216	311	311	39	39	20	20	77	9,463 63
1895	2,184	3,279	601	163	374	374	52	52	20	20	70	11,673 26
1896	2,185	3,437	653	212	331	331	68	68	14	14	161	10,579 54
1897	2,606	3,548	756	273	446	446	75	75	13	13	94	14,101 93
1898	2,576	3,453	734	275	423	423	136	136	15	15	114	13,535 17
1899	2,487	2,910	702	237	430	430	112	112	5	5	117	14,161 28
1900	2,679	3,213	893	247	447	447	126	126	22	22	136	14,782 53
1901	2,605	3,211	888	249	521	521	146	146	24	24	183	16,823 26
1902	2,687	3,257	900	196	528	528	164	164	26	26	222	17,703 09
1903	2,687	3,211	900	176	557	557	88	88	23	23	272	18,086 25
1904	2,858	2,793	1,106	228	621	621	107	107	25	25	118	20,647 30

The total number of registrations of copyrights, trade marks, industrial designs and timber marks, including registrations of assignments, was 2,021, during the year ended October 31, 1904. This consisted of 1,106 registrations of copyrights, 621 registrations of trade marks, 107 of industrial designs and 25 of timber marks. There were also issued 214 certificates of copyrights, 44 registrations of interim copyrights, and 12 certificates, 8 registrations of temporary copyrights, and 2 certificates. The total number of assignments of these different rights recorded was 118.

The correspondence of this branch of the department amounted to 2,858 letters received; 2,793 letters sent.

The amount of fees received during the year, as certified by the accountant, amounted to $20,647.30.

V.—PUBLIC HEALTH AND QUARANTINE.

The threatenings of bubonic plague, cholera and smallpox, mentioned in my last annual report, have continued in this quarantine year.

The continuation of strict precautionary measures, ordinary and special, for the sanitary protection of the country has, therefore, been necessary.

The continued public demand for governmental recognition of the importance of hygiene and preventive medicine, referred to in my last annual report, is instanced by the fact that I am in receipt of a copy of a resolution, adopted by the Canadian Medical Association at its annual meeting, at Vancouver, B.C., in August last, again

pressing upon the consideration of the government the expediency of creating a department of public health under one of the existing ministers.

Circulars of warning and instruction have been issued from time to time, as the threatenings of disease on both our coasts and on our frontier seemed to require.

The exemption from routine inspection, on the Atlantic side, of vessels arriving from New York and ports north thereof—provided for in section 9 of the regulations—and usual in healthy years—was resumed this year, owing to the practical cessation of the existence of smallpox as an epidemic in the New England and contiguous States.

On the Pacific side, inspection of all vessels from San Francisco has been maintained throughout the year, on account of the threatening of bubonic plague from that city. As, however, no case of the disease has been reported in that city since March 1 last, I have it under my consideration whether these inspections may not soon be again suspended.

Extra coast and frontier inspections were instituted or continued by me for shorter or longer periods, as seemed to be required, at the following places:—In Nova Scotia, Louisburg, Yarmouth and Canso ; in New Brunswick, McAdam Junction, Edmundston, Houlton (Debec Junction) and St. Stephen ; in Prince Edward Island, Georgetown; in Ontario, Sault Ste. Marie and Rainy River; in Manitoba, Sprague, Morden, Crystal City, Killarney and Deloraine; and in British Columbia, Rossland, Grand Forks and Greenwood; and vessels from the north were specially inspected at British Columbia ports during an outbreak of smallpox in Alaska. And those arriving at Charlottetown and Georgetown, P.E.I., were specially inspected during an outbreak of that disease in Cape Breton.

In addition to the officers holding the above-mentioned posts, Dr. James Patterson, of Winnipeg, has continued to act for me in the management and suppression of smallpox in the North-west Territories. So well has this been done, that there is now no case of that disease in the Territories, nor has there been for the last ten weeks.

Owing to the continued increase in the shipping coming to Louisburg, in Cape Breton, that port—heretofore an unorganized maritime quarantine station—was created a regular quarantine station by Order in Council dated January 8 last. A permanent medical officer has been appointed in charge.

The bubonic plague claimed victims from time to time in San Francisco since my last report. There have been during that period twelve cases reported, with eleven deaths. The last case reported was on March 1 last. The summary since the disease was first reported is: calendar year 1900, 22 cases, 22 deaths; 1901, 30 cases, 25 deaths; 1902, 41 cases, 41 deaths; 1903, 17 cases, 17 deaths, and 1904, to date, 9 cases, 8 deaths. Total, 119 cases, 111 deaths.

This disease has occurred during the year in South Africa, Australia, Brazil, Chili, China, Egypt, Formosa, Hawaii, India, Japan, Mauritius, Peru, Philippine Islands, Turkey, and in San Francisco.

Cholera has prevailed during the year in Afghanistan, Borneo, China, Formosa, France, India, Japan, Persia, Philippine Islands, Russia, Straits Settlements, and Turkey.

Yellow Fever.—Later researches and reports only serve to confirm all health authorities in doing battle with the mosquito, *Stegomyia Fasciata.* In Havana, Cuba, no case of yellow fever has originated since September, 1901, since which time the city has been entirely exempt from the disease, that had there kept stronghold for at least a century and a half. Cases are now admitted into Havana from Mexican ports, but are treated under screens with perfect impunity, in the ordinary hospitals. The crusade against the insects has also caused a large decrease in malarial fevers.

Smallpox has again prevailed world-wide during the year. It continued to threaten us on the Atlantic and Pacific coasts, and along our international frontier. The epidemic of this disease which has been present for the last four years in the United States seems now to be nearing its end.

The diseases which have been brought to my maritime quarantine stations, during the year, are: smallpox, diphtheria, scarlet fever, measles, chickenpox, enteric fever, and beri-beri.

In not a single instance during the year did any one of these diseases gain an entrance through any of my organized quarantine stations. My frontier inspections were also very efficient in protecting the public health of the country with the least possible interference with trade and travel.

In order that vessels shall not be unduly detained and hampered by imperfect appliances at my maritime quarantines, I am endeavouring as far as possible to move *pari passu* with the advances being made by the modern passenger steamship business. The large open steerages are being replaced by small compartments, and coal oil light has been almost universally superseded by electricity. Similar changes are being pushed at my stations. Large detention sheds heretofore all in one room, at Grosse Isle, and at Halifax, have been subdivided into small compartments. At Grosse Isle and at William Head electric lighting has been installed and works well. At Partridge island, St. John, N.B., the acetylene gas is being installed. At this latter station also steps have been taken to ensure a good water supply from the city mains, and, in view of the ever increasing business of the port, to erect more detention houses for those who have to be kept under observation, and a proper winter hospital. A deep water wharf here as at Grosse Isle will be requisite before the station can be considered as thoroughly equipped. Provision has been made in this year's estimates for the commencement of the extension of the Grosse Isle wharf into deep water. A new large steam disinfector has been installed at William Head, B.C., and a small one arranged for at the Tracadie Leper Lazaretto. The new station at Louisburg will require at least the minimum equipment of wharf, disinfector and hospital on approximately the same scale as those at Sydney, C.B.

LEPER LAZARETTO, TRACADIE, N.B.

The State of Louisiana, U. S., has recently erected a lazaretto for lepers, and an expert of the United States Public Health and Marine Hospital Service has pro-

nounced it 'the equal of any hospital for lepers in the world, and superior to all in equipment and the method of treatment, except that of Tracadie, province of New Brunswick, Canada.'

Details of this year's work at my different stations, at the Tracadie Leper Lazaretto in the North-west Territories, and under the Public Works Health Act, will be found in the reports of my officers annexed hereto.

VI.—STATISTICS.

The Statistical Division of the Department of Agriculture is based upon the Union Act of 1867, which specifically assigns Census and Statistics to the exclusive authority of the Parliament of Canada.

In accordance with this assignment of duties, the Dominion Parliament passed chap. 21 Acts of 42 Victoria.

In the Revised Statutes of Canada, 1886, this Act forms chaps. 58 and 59. Chap. 60 is the authority for the collection of criminal statistics.

Chap. 59, Revised Statutes of Canada provides (1st section) for the collecting, abstracting, tabulating and publishing of vital, agricultural, commercial, criminal and other statistics by the Department of Agriculture.

The fourth section gives the Minister of Agriculture power to arrange with any Lieutenant Governor in Council, or with any provincial organization for the collection and transmission of information collected under provincial systems.

The fifth section says:—

'The Minister of Agriculture may, in collecting statistics in the manner provided by this Act, call upon any and all public officers to furnish copies of papers and documents and such information as lie respectively in the power of such officers to furnish with or without compensation for so doing, as is regulated, from time to time, by the Governor in Council.'

The sixth section provides for the publication of an abstract and record of the various departmental or other public reports and documents.

The seventh section gives power to the Governor in Council to authorize the Minister of Agriculture to cause special statistical investigations as regards subjects, localities or otherwise to be made.

The eighth section empowers the Minister of Agriculture to cause all statistical information obtained to be examined, and any omissions, defects, or inaccuracies discernible therein to be supplemented and corrected as far as possible.

The ninth section is as follows :—

'Every one who wilfully gives false information or practices any deception in furnishing information provided for by this Act shall, on summary conviction before two justices of the peace, be liable to a penalty not exceeding one hundred dollars.'

By another section of the Act, the Governor in Council is empowered to appoint temporary clerks or employees for an indefinite period.

The evident aim and intention of these several Acts is the establishment of a Bureau of Statistics, which shall form part of the Department of Agriculture, and in which shall be consolidated the general statistics of the country, the officers in charge of which shall have every facility necessary to enable them to obtain the needed statistics from the several departments of the federal government, and of the provincial governments, or by special statistical investigations.

A general collection and issue of Dominion government statistics by the statistical division, as directed by the statute, would establish uniformity, coupled with increased accuracy and large economy in compilation.

The statistical division has collected during the year material to enable it to provide a system for collecting agricultural statistics throughout the Dominion supplementary to the system employed in some, but not all, of the provinces. If a good plan insuring accuracy and early publication could be adopted in Canada, the value to farmers and business men of this information can hardly be over-estimated. The crop reports of the United States, going over all Europe monthly, are a good advertisement of the agricultural possibilities of the country, while an early knowledge of the actualities gives to growers and dealers an advantage, in connection with output and prices, which is of direct pecuniary value.

The frequency with which applications are made to the statistician for information about the crops of Canada, coming as these applications do both from within the Dominion and from outside countries, suggests the advisability of establishing in the near future a statistical inquiry dealing with crops, prices, cost of transportation and like matter.

A great increase in the number of applications for statistics is one feature of the year's experience.

The greater interest taken in Canada is seen in this increased demand.

Annual publications of many countries call for statistics of Canada to a much larger extent than in former years. The number of the list is so great as to make large demands on the time of the officers of this division.

The usefulness of this branch of my department is illustrated by the following letter :—

OFFICE OF EMPLOYERS' ASSOCIATION,
TORONTO, December 23, 1903.

SIR,—I cannot express to you how much we appreciated your kindness in sending such a thorough account of the cost of living in connection with the arbitration matter that I wrote you of in November. I am pleased to say that in view of the splendid information that we were able to put forward that the arbitration was amicably settled and the strike, which might have proved a very embarrassing one, was averted.

The arbitrators desire me to convey to you their very heartiest thanks for the care that was displayed in picking out the salient points that bore directly upon the ques-

tion in issue. I may have occcasion from time to time in arbitration matters of again asking your assistance, and I trust that you will overlook the trouble occasioned in the general benefit to the workingmen of this city.

Thanking you again,

I am,

Yours very truly,

(Signed) JAMES G. MERRICK,

Secretary.

HEALTH STATISTICS.

No steps have been taken as yet to provide a better system of collecting vital statistics than that which was abolished in 1891.

In the province of Ontario, Quebec, New Brunswick, British Columbia, Manitoba and the North-west Territories, the provincial and territorial authorities have placed on the statute-books Acts dealing with the collection of vital statistics. Section 4 of chap. 59, Revised Statutes of Canada, already quoted, gives the necessary legislative authority to enable my department to join the provincial authorities in making arrangements for the better collection of different kinds of statistics, without limiting the power of my department to enter upon provincial fields not worked by provincial organizations. By a combination of forces the result would be more satisfactory than by any other system that could be originated by the federal authorities. Instead of clashing statistics there would be statistics having a joint approval.

CRIMINAL STATISTICS.

The detailed analysis of these statistics which has accompanied in former years the general report of the department will be found this year, as in the last two years, in the introduction of the special report on crime published as a separate blue-book.

A few salient points may be given.

The number of charges, in 1903, for indictable offences was 9,622, and the number of convictions was 6,521. The percentage of convictions to charges is : 1903, 67·77 per cent; 1902, 66·22 per cent, 1901, 68 per cent; 1900, 68·51 per cent and 1899, 69·22. The year 1903 shows an improvement upon 1902, but the proportion is still below what it ought to be, though it is satisfactory to note that apparently the references in last year's report to this defect have been productive of good.

In England and Wales the percentage of convictions to charges is 81·3 per cent ; in Scotland 82·80 per cent, and in Ireland 65·3 per cent.

Analysis by provinces shows that with the exception of the province of Quebec all the provinces are below the Scotch and English standards, Quebec having for a period of nine years an average of 84·82 per cent, a figure approached by no other province.

In the year 1903, New Brunswick has the poorest record, 36 charges in every 100 failing to result in conviction ; Ontario has 35 failures in each 100. I suggest care-

ful study, by the judiciary of the country, of the situation with a view to discover the reasons for such a gap between charges and convictions as the statistics show.

This is the more necessary because in some of the provinces this gap between charges and convictions seems to be widening with the years. Thus in Nova Scotia 81·85 per cent of the charges in 1895 resulted in convictions. The next year gave 81·34 per cent ; the next gave 80·20, with 1902 at 65·83 and 1903 with 66·07 per cent, a slight improvement in 1903 compared with the previous year but serious deterioration compared with the percentage of 1895.

Ontario has for many years had a low percentage of convictions, that of 1895 being 65·10; of 1899, 64·84 and of 1903, 64·80, showing that low as was the proportion in 1895 the trend has been to still lower percentages.

The aim of all the provinces should be to attain the high percentage reached in the province of Quebec. A careful study of the methods pursued in Quebec might result in great improvement in the other provinces.

The number of convictions under the two heads of indictable offences and summary convictions in 1903 was 50,383, an increase of 6,847 compared with 1902. This increase is divided into 861 indictable offences and 5,986 summary.

Of the 50,383, there were 6,521 convictions under the head of indictable offences and 3,042 acquittals. There were 15 detentions for lunacy, an increase of 4 over the previous year and indicating a general increase in lunacy supported by the Census of 1901, which showed that the unsound of mind increased over 23 per cent in the ten years. The indictable convictions in 1903, compared with 1902, show a decrease in Prince Edward Island, Nova Scotia, New Brunswick, Ontario, and British Columbia, and an increase in Quebec, Manitoba and the Territories and Yukon.

With respect to sex in crime, the record of the indictable convictions of 1903 gives emphasis to the conclusions of last year, viz.: that girl criminality shows a relative decrease ; that between the ages of 16 and 21 there has been for 1901-3 an increase in the number of women committing crime as compared with 1895-7 and 1898-1900, that for women of mature years the records show a decrease, and that there is a steady increase in the number of women who do not know their ages.

This latter fact indicates in a general way an increase in the ignorant criminals of the country.

Under the heading of indictable offences, class III. includes offences against property without violence and in this class are included such crimes as embezzlement, fraud, &c. Under these sub-divisions 24 women were convicted in 1903 against 16 in 1902. The chief subdivision is larceny from the dwelling and from the persons and larceny of letters. As revealing the besetting sin of women criminals of Canada, the records show that of the convictions of women for all kinds of indictable offences nearly two-thirds are for larceny. There are 404 convictions of women for indictable offences in 1903, and 263 of these were for stealing.

The tables which have been prepared for the detailed report show that the eastern or maritime provinces have fewer women convicted of the crime of stealing than their proportion of women warrants ; that in the province of Quebec the women convicted of stealing are about equal to their proportion of the total population ; and that the province of Ontario stands alone in having a larger proportion of its women convicted stealers of property. Ontario has 41·47 women in every 100 women of the Dominion ; it has 56·74 per cent of the women convicted of stealing.

In dealing with stealing by women the courts of Quebec province stand at the head of all the provinces. There were 718 charges of theft by women brought before the courts in 1903, with the result that 650 were convicted, over 90 per cent. Manitoa alone of the other provinces approached the Quebec standard, having 80 per cent of the 107 women charged, in the convicted column.

The total convictions for larceny by both sexes in 1903 were 3,316 and in 1902, 3,104. Convictions of women for this crime were 12·2 per cent of the whole in 1903 and 10·98 per cent for 1902, thus proving that women formed a larger proportion of the stealers.

RURAL AND URBAN CRIME.

The returns for 1903 covering the indictable misdemeanours of both males and females show that over 70 per cent of the persons convicted of indictable offences are residents of cities and towns. The 'not given' being, for 1903, 734 cases, renders it difficult to obtain satisfactory conclusions. The increase—232—suggests less care on the part of those whose duty it is to obtain these details. I cannot too strongly urge upon the officers of the courts that the value of these statistics is immeasurably enhanced by the careful filling in of the forms distributed by my department.

The same laxity is evident in the returns of occupations. These were not filled in in 2,464 cases in 1903 compared with 1,731 cases in 1902. Possibly the fact that 'occupation' was left blank in so many more cases is due to the existence of a 'hobo' class without regular occupations, to an increasing degree.

The co-operation of the officials of the courts is absolutely necessary in order to secure trustworthy materials upon which to base conclusions reasonably accurate.

BIRTHPLACES OF CRIMINALS.

The English and Irish born portion of our Canadian population show a tendency to a decreasing ; the Scotch to an increasing proportion of the criminals. Criminals born in Canada show a tendency to decrease relatively to the mass of criminals recorded. The Canadian born formed 87 per cent of the total population in the Census of 1901. The criminal born in Canada formed 66 per cent of the criminal population in 1903, showing that the outside element, which is 13 per cent of the whole population, contributed 34 per cent of the criminals, considerably more than its proper share.

The foreign-born elements in Manitoba, the North-west and British Columbia do not appear to have contributed more than their share towards the criminality of those portions of the Dominion. Considering the large influx from outside into the west, it is highly gratifying to have from the statistics of the criminal courts so satisfactory a certificate of the high standing of the immigrants going into the west.

The statistics indicate that the tendency towards a habitually criminal class, marked in other countries, is also in evidence in Canada. Taking the average of sixteen years—1887-1902—as a fair indication of the tendency, there has been an increase from 7·50 per cent to 9·03 per cent in 1903.

With regard to juvenile delinquency, the records indicate a large increase in the list of boy criminals. In the period 1887-1890, boys under sixteen years convicted of indictable offences were 14·33 per cent of all the convicted of all ages. In 1889-1903, they were 15·43 per cent.

SUMMARY CONVICTIONS.

Of summary convictions there were 43,862 in 1903, an increase of 6,046, or 15·8 per cent; equal to nearly one-sixth. Nova Scotia shows an abnormal increase of 29 per cent. The North-west Territories show a still larger increase of 148 per cent. A great part of the increase in Nova Scotia is due to an abnormally large increase in the judicial district of Cape Breton, where the increase was 1,273, while the total increase for the province was 1,003 convictions.

DRUNKENNESS.

The convictions for drunkenness in 1903 were 16,532, an increase of 3,805 compared with 1902. Of these, 693 were convictions for drunkenness in the town of Sydney, N.S.

All the provinces, excepting Quebec and the Yukon, show increases. The statistics of the courts in respect to drunkenness agree with the returns published in the Statistical Year Book, which show that consumption of spirits has increased between 1900 and 1903 by 24 per cent.

THE STATISTICAL YEAR BOOK.

This work is published by my department under authority of chapter 59, section 6, Revised Statutes of Canada.

The demand for the book is greater each year. To meet this increasing demand, parliament granted an increased appropriation for the Year Book, and, acting upon it, I had 1,400 added to the number printed for 1903—1,000 English and 400 French. In the previous year, the added numbers were 1,500 English and 200 French. The demand still remains greater than the supply. Advantageous openings present themselves all the time in a yearly increasing degree as Canada attracts increased attention among the nations of the world.

The plan of issue is to send first to the members of parliament and the government, the members of the several legislatures and the executives of the several provinces, then to the leading newspapers, boards of trade, banks, libraries, British consuls and other representatives of different countries, the legislative libraries of other parts of the British Empire. The remainder is held for distribution in Canada, according to a permanent list, and to meet applications. It is in connection with the permanent list and applications that the supply falls short.

The following are the dates of the issues of the Year Book:—

1896—Issued		October 12, 1897
1897—	"	October 4, 1898
1898—	"	October 10, 1899
1899—	"	August 21, 1900
1900—	"	June 22, 1901
1901—	"	May 15, 1902
1902—	"	May 28, 1903
1903—	"	June 29, 1904

The provincial governments, I am pleased to note, have co-operated most heartily in the effort to publish the Year Book at an early date. The municipal authorities have been prompt in supplying the material required, and the various commercial and manufacturing firms from whom information was sought, kindly and most considerately gave their prompt attention to the circulars sent them.

There is a great demand for back numbers to make up full sets. The demand from the United Kingdom for full sets has increased very considerably. As a result, the issues of 1893, 1894, 1895, 1896, 1898, 1899, 1900 and 1901 are exhausted.

The Year Book in French is increasingly demanded. Of late years (1891-8), there remain very few copies, and of 1891, 1893, 1894, 1895, 1896, 1897, 1900, 1901 and 1902, none at all.

There has been a very considerable demand for other publications of the statistical division. The Criminal Statistics have been sought after by writers of other lands, as well as by students in Canada. The handbook on Canada and the pamphlet on pulp-wood were in demand in the St. Louis Exhibition.

The correspondence of the statistical branch increases steadily from year to year, due in part to the large edition of the Year Book issued, and to the increasing demand for it, and also to the ever-increasing demand for general statistical information by the public.

The whole respectfully submitted.

SYDNEY. A. FISHER.
Minister of Agriculture.

PUBLIC HEALTH.

No. 1.

REPORT OF THE DIRECTOR-GENERAL OF PUBLIC HEALTH.

F. MONTIZAMBERT, M.D.Ed., I.S.O., F.R.C.S., D.C.L.

October 31, 1904.

SIR,—I have the honour to submit this my annual report as Director-General of Public Health to October 31, 1904.

This year, like the ones immediately preceding it, has been marked by the continued threatening of bubonic plague, cholera and small-pox.

Strict measures, ordinary and special, have therefore been required for the sanitary protection of the country. The special measures explained at length in previous annual reports have therefore been continued throughout most of the year.

Frontier inspection for small-pox at threatened ports of the international border, and extra inspections at some of the maritime ports have been maintained more or less throughout the year as the conditions to the south of us have seemed to require. The epidemic of this disease which has raged in the United States for the last four years seems now to be drawing to an end. The number of cases reported has become so small that it has been considered safe to suspend the services of the frontier inspectors this summer. Whether the diminution of the disease and its present practical return to its ordinary limits be permanent, or whether it be largely due to the usual seasonal lessening in summer to be followed by renewed increase with the setting in of winter remains of course as yet to be seen.

On the Pacific side careful inspection of all arriving Asiatics has been carried on throughout the year. This includes the testing of the temperature and the examination of the glandular regions. Inspection of passenger vessels from San Francisco is continued on account of the possibly continued presence of plague in that city. The last death reported was on March 1, 1904.

Precautions as to funnels on hawsers, guarding of gang planks, &c., to prevent the embarkation of rats at ports of departure or their landing at our ports have continued to be impressed upon the shipping companies.

Dominion Department of Public Health.—The Canadian Medical Association at its meeting in Montreal, in 1902, passed a strong resolution to the effect that it is expedient that a Department of Public Health be created by the Dominion government, and administered under the authority of one of the existing Ministers of the Crown, thus bringing all general questions relating to sanitary science and public health under one central authority to be known as the Public Health Department. In 1903, at the London meeting, this resolution was reiterated, and the committee that had been charged with the matter was urged to press it strongly upon the immediate attention of the government. This year, in August, at the meeting in Vancouver, B.C., the committee submitted the following report :—

'Your committee in charge of the question of the establishment of a Department of Public Health by the Dominion government have the honour to report that the matter has, to a certain extent, been in abeyance since our meeting at London last

year. At that meeting you will recollect we reported certain interviews with the Prime Minister and the Minister of Agriculture, at which we were led to understand that it was not feasible for the government to give us any assurance that our wishes in the matter could be practically considered. The resolution again passed at London pressing the subject on the attention of the government as one closely associated with the country's welfare and best interests was duly forwarded to the Dominion authorities.

'It was also pointed out to the Hon. the Minister of Agriculture by the convener of your committee that the medical profession of the Dominion as represented by the Canadian Medical Association were united in their desire to have such a department created and that they were only actuated in the matter by motives of patriotism, feeling assured that the administration of public health in matters pertaining to the Dominion government would be greatly facilitated and rendered more useful and satisfactory if it emanated from a central department instead of having a series of branches having executive authority scattered through a number of departments of the government.

'Your committee are gratified to be able to report that there are evidences that, during the present recess, the matter will engage the attention of the Privy Council more seriously than it has hitherto done. Before legislation could be introduced, certain questions involving much consideration will have to be settled, and we are given to understand that these preliminaries will be weighed before Parliament meets. While it is to a certain extent unsatisfactory to be obliged to report in such an indefinite way, yet we trust the association will understand we have not been idle, but that in a matter of this kind we are in the hands of the goodwill of the government and that it would be neither judicious nor delicate to compromise the present favourable opportunity by referring in detail to the reasons that have enabled us to hazard our present opinions.'

And the following resolution was moved by Dr. Lafleur, of Montreal, seconded by Dr. Meredith Jones, of Victoria, and unanimously carried :—

'That the Canadian Medical Association regret that the Dominion government have not yet seen their way clear to carrying out the suggestions contained in the several strong resolutions of this association passed during the past three years on the question of the establishment of a Department of Public Health under one of the existing Ministers of the Crown.

'That it be further resolved that this association continue to press the wishes of the medical profession of the Dominion on this subject on the attention of the government inasmuch as we feel assured that the difficulties to be overcome in order to bring about such a desirable end are of small consequence to the public welfare compared to the beneficial results that will follow.

"That the sub-committee in charge of this matter be reappointed at this meeting and requested to continue their efforts of the past three years.

'That a copy of this resolution be sent by the General Secretary to the Right Hon. the Prime Minister, to the Hon. the Minister of Agriculture and to the Hon. the Secretary of State.'

In England, the British Medical Association is busily engaged in advocating the extension of the powers vested in the health departments of the civil, naval and military populations on a scientific basis. The Bradford meeting of the Sanitary Institute, the Brussels Congress of Hygiene, 1903, and many other meetings have approved the formation of a health ministry, with or without an expert as Cabinet Minister of Public Health.

In New South Wales, a conference of officers of various boards of health drafted a bill for the establishment of a central department, under the control of a director-general, who should be a man possessing both scientific and administrative attainments, and should be paid at a salary of at least £1,800 per annum, with a well paid assistant and a sufficient staff to enable him to carry out his various and onerous duties. And they further recommend—as I have done here for years—that the central office should have attached to it a complete laboratory.

Public Health Science.—A paper was read on this subject last month by Prof. Wm. T. Sedgwick, of Boston, he said : 'that he used the term public health science advisedly, for any division of human knowledge that had worked out its own laws with strict adherence to the rules of inductive and deductive reasons as public health science had done, and which had reached results which enabled it to predict with accuracy as could now be done in public health science, was entitled to an honourable place among the physical sciences. Public health science had its rise and remarkable development in the eighteenth century; before that time, efforts tending to promote or protect public health being entirely empirical and as often directed to the convenience of mankind as to their safety. In 1767, Sir George Baker made the first scientific discovery in public health science, which happened to be in epidemiology, when he found that the epidemic of colic in Devonshire, England, was due to an obscure poisoning by lead conveyed through the common cider of that district. In 1774, the foundations of state hygiene and sanitation were laid, in consequence of the startling revelations of John Howard, by an Act of Parliament providing for the sanitation of jails and prisons. The beginnings of marine hygiene and sanitation appeared in 1776 when Captain Cook was awarded the Copeley medal of the Royal Society for his remarkable success in protecting the lives of his sailors on his second voyage. In 1796, Edward Jenner, who also worked in a strictly scientific manner and employed the methods of rigid inductive research, laid securely for all time the foundations of personal hygiene and immunization by showing that such modifications of the physiological resistance or susceptibility of the human body could be produced at will so as to make it immune to small-pox. In the eighteenth-century discoveries were the germs of some of the most important divisions of public health science, namely, epidemiology, sanitation, and immunization, and their importance to the public health science of the time and to the development of public health science for all centuries to come was incalculable. In 1802, the beginning of factory hygiene and sanitation was made; in 1829, the first municipal water filter was constructed; in 1834, the discovery of the important relation of poverty to public health, revealed in the famous report of the Poor Law Commissioners; in 1839, the beginnings of registration and accurate statistics; in 1854, for the first time, was clearly taught the lesson, even yet not properly taken to heart, that water may be the ready vehicle of a terrible epidemic of cholera. From 1860 striking epidemics of trichinosis came into public notice, and here, also, belonged the magnificent work of Pasteur; in 1868, Lister following in the footsteps of Pasteur, revealed the true basis of cleanliness in asepsis; in 1876, bacteriology became firmly established by Koch's studies on anthrax. The decade from 1880 to 1890 could be called the decade of etiology, since then were discovered the hitherto unknown microbes of typhoid fever, tuberculosis, malaria, Asiatic cholera, diphtheria, and tetanus. There was an extraordinary public awakening in England in the middle of the nineteenth century to the importance of sanitation and public health measures, but for some time there was no marked inosculation between public health science and other sciences, such as physics, chemistry, microscopy, bacteriology, climatology, engineering or education. It was not until Pettenkofer and his disciples in Germany, and Angus Smith and others in England, began their splendid chemical work that the tributary stream of sanitary chemistry added materially to that of public health science. The science of architecture, including building construction, heating and ventilation, has done and will continue doing much of importance to the student of public health science.

Bubonic Plague.—This disease has occurred during the year in South Africa, Australia, Brazil, Chile, China, Egypt, Formosa, Hawaii, India, Japan, Mauritius, Peru, Philippine Islands, Turkey, and in San Francisco.

India.—This disease has continued its ravages in epidemic form throughout the year, the deaths at the height of its seasonal intensity showing the appalling mortality of 40,527 in a week. It is calculated that since 1896 over 2,000,000 people have died

in India from the plague. In answer to a question in the British House of Commons Mr. Brodrick replied that all possible care was taken to prevent the spread of plague throughout India. Speaking generally the State medical officers of the native States forming the Central India agency applied in the territories of their respective states the preventive and remedial measures which were employed in British India. These comprised (1) the provision of hospitals and medical aid for the sufferers; (2) disinfection of infected houses; (3) evacuation of infected quarters in towns and villages; (4) refuge camps for the uninfected; (5) inspection posts and observation huts at railway stations and on main routes; (6) inoculation where desired.

South Africa.—Plague has existed in Cape Colony for some four years, and although in no town or district except, perhaps, Port Elizabeth, has plague assumed any considerable proportions, yet the continued presence of the disease in both men and rats in several towns of Cape Colony and in Durban, Natal, rendered the possibility, of a serious outbreak, either within the infected area or in adjacent towns or districts, an ever-present cause of anxiety. Plague has visited the following towns in South Africa since it first appeared : Cape Town, Port Elizabeth, East London, Queenstown, King William's Town, Knysna, Lady Grey Bridge and Durban. It is still present at Port Elizabeth, there being three cases under treatment there, the last discovered on the 19th instant.

Plague-infected rodents continue up to the last reports, October 24, to be found there, and at East London.

In the Transvaal, there has been quite an outbreak, at Johannesburg : also to a lesser degree in Pretoria. It is claimed, however, under date of October 15, that the Transvaal is now clear of plague.

In Hong Kong, the disease was not as prevalent as last year, and it has again subsided with the passing of the warmest season.

In Russia, there was a case of laboratory infection of plague near Cronstadt :—

'The laboratory for plague reseach at St. Petersburg is located on an isolated island near Fort Alexander. The director of the institute for experimental medicine and the production of antiplague serum was engaged at the laboratory with living plague cultures when he contracted the plague, January 26, and died in four days, notwithstanding repeated injections of antiplague serum. All the other persons connected with the laboratory were given preventive injections, but two new cases have developed. The entire establishment is strictly quarantined. The death of the director recalls those of Dr. Müller at Vienna and Dr. Sachs at Berlin, under similar circumstances.'

In San Francisco, there has not been a death from plague since March 1, 1904. The summary is: calendar year 1900, 22 cases, 22 deaths; 1901, 30 cases, 25 deaths; 1902, 41 cases, 41 deaths; 1903, 17 cases, 17 deaths; 1904 to date, 9 cases, 8 deaths; total, 119 cases, 111 deaths.

The sanitary work and inspection still goes on in Chinatown, San Francisco, the following being the last summary of work reported from there in Public Health reports for the week ending the 29th instant :—

Buildings reinspected	235
Rooms	1,793
Persons inspected	2,390
Sick	15
Sick prescribed for at oriental dispensary	15
Dead examined	5
Necropsies	1
Rats examined bacteriologically	55
Number showing pest infection	0
Places limed and disinfected	850
Times streets swept	3
Sewers flushed	18
Blocks covered with Danysz virus	18

Sewers baited with phosphorus poison	18
Notices sent to abate plumbing nuisance	8
Abated	7
Undergoing abatement	12
Total number of plumbing inspections	109

In Sydney, New South Wales, plague-infected rats continue to be found in certain parts of the city, principally in the neighbourhood of Sussex street, where the produce stores are chiefly situated. Two rather rapidly fatal cases of plague in human beings have occurred at a large house situated some miles from the centre of the city, in a healthy suburb. The first case was that of a coachman who was employed at this house; he slept over the stables, which were found to be overrun with rats. Bacteriological examination of two dead rats from this house proved them to be plague-infected, and it is surmised that they were infected by other diseased rats carried to this house in fodder. The second case was that of a woman, aged 31, a housekeeper employed at the same house, who had gone to visit the sick coachman, and who herself became infected, and died in about forty hours. The occurrence of these two fresh cases has again called forth a warning from Dr. Ashburton Thompson, the President of the Board of Health, who reminds citizens that the recurrence of an unusual mortality amongst rats, and the finding of dead rodents in unusual places, would be considered as evidence of the existence of plague. Under these circumstances, if people so situated do not give the Health Department immediate information on the matter, they will be liable to prosecution.

Serumtherapy of Plague.—A correspondent of the *British Medical Journal,* September 24, 1904, gives the following description of the Bombay Plague Research Laboratory :—

'This laboratory was founded by Mr. Haffkine at the outbreak of plague in India at the end of 1896. Very soon it became clear that general measures of disinfection, isolation, segregation, etc., were not applicable to the circumstances of this epidemic. The activity of the laboratory was then concentrated on the manufacture and distribution of the prophylactic for preventive inoculation worked out and introduced by Haffkine. During the seven and a half years that the laboratory has been working under his direction, the number of doses of the material issued to applicants in India and other countries has amounted, up to the end of March last, to 5,757,225. Of these, 504,966 were supplied to countries outside India, and 5,252,259 to districts in India.

'It is claimed that the number of deaths from plague has been reduced by this inoculation to less than one-sixth of what it is among the non-inoculated. In the severe epidemic in the Punjab of 1902-3, half a million people were inoculated by medical men specially sent out from England. According to the latest information published by the government of India, the proportion of deaths to attacks in the inoculated was under 25 per cent, or less than one-half of that observed in the non-inoculated. From numerous observations it results that the number of attacks is less than one-third of that in the non-inoculated population. These figures refer to the Indian natives, whose susceptibility to plague is, like that of the Chinese, much higher than the susceptibility of the white races. Among inoculated European residents no fatal cases of plague have so far come to notice.

'The prophylactic material for inoculation according to Haffkine's method is now manufactured and obtainable not only from the Bombay Laboratory, but also from the Local Government Board, through Professor E. Klein, at St. Bartholomews' Hospital; from the Lister Institute for Experimental Medicine; from the Thompson-Yates Laboratories, Liverpool; from the Pasteur Institute in Paris; from the Institut für Infektionskrankheiten, in Berlin; from the Institut Impérial de Médecine Expérimentale, St. Petersburg; from the Swiss Bacterio-Therapeutic and Vaccinal Institute, Berne; from the Government Laboratory in Pianosa, Italy, and from the Laboratory of the Insular Board of Health, Manila, Philippine Islands.

'Attempts at treating native patients in hospitals with antiplague curative serums have not been successful. The first experiment in this direction was made in 1897-8, soon after Dr. Yersin's original publication, with a serum prepared in Bombay by M. Haffkine. An inquiry which he instituted led him to the conclusion that the treatment had no effect on the mortality rate. The preparation of that serum in Haffkine's Laboratory was then abandoned; but in 1898-9, an experiment on a large scale was carried out in one of the Bombay plague hospitals with a serum prepared by Professor Lustig, of Florence, the method of testing being the same as was applied by Haffkine to his serum. This method, in its main features, consisted in treating one out of every two patients admitted to hospital, and comparing the clinical features of the disease and the mortality rate with those in the remainder of the patients. Of 900 cases thus admitted, the 450 so treated had 55 deaths less than the 450 not treated; but a careful analysis of the cases showed that, in this experiment, there was a marked preponderance of grave cases among those admitted into the non-treated group, compared to those in which the serum treatment was applied. Between November, 1902, and July, 1903, another experiment was made, under stricter conditions, and under the direct supervision of the laboratory, with a serum prepared by Professors Terni and Bondi, in Messina. In this instance, the cases for treatment were taken alternately, as they came in, no selection of any kind being permitted. Of 111 patients thus treated 90 died; of 112 admitted alternately with the above, and left without serum injections, 91 died. Subsequently, another batch of 16 patients were treated with the same serum in another Bombay hospital, 16 alternate patients being left for comparison. Of the first category 12 died, and of the second, 11. In 1904, a serum prepared by Dr. Brazil in San Pavlo, which was reported to give good results in Brazil, was tried by the laboratory. In one hospital the proportion of deaths, among the injected, was 41 out of 50, and among the control cases, 45 out of 50; in another, the injected gave a proportion of 17 deaths out of 20, and the control cases, of 15 out of 20. The treatment in all cases consisted in hypodermic injections, the doses in the latter experiments amounting sometimes to several hundred cubic centimetres. Investigations have now been started with Yersin's serum manufactured in the Pasteur Institute in Paris, and intravenous injections are being tried. M. Haffkine is of opinion that his results, so different from those reported by other experimenters, may be due to the greater susceptibility to plague of the natives in India, as well as to the difficulty of getting them early for treatment in hospitals.

'Investigations made in the laboratory into the transmissibility of plague by means of rat fleas have given so far negative results, though the hypothesis itself appears extremely plausible. A large amount of research has been done in the laboratory in various other directions in connexion with plague and other disease, such as different methods of disinfection, serum diagnosis of enteric fever, Malta fever, plague; distribution of plague bacilli in tissues and secretions of sick and convalescent; the presence or otherwise of plague microbes in dwellings, clothing, furniture, and soil, and in various species of animals, &c., as well as on cholera, relapsing fever, scurvy, epizootic lymphangitis, beri-beri, snake venom and antivenene, scorpion venom, diphtheria, leprosy, variola and vaccinia, surra, lathyriasis; on the morphology and classification of mosquitos, &c. Only a part of these investigations has been published, the majority being contained in laboratory records and reports to government, which will never see the light of publicity. We understand that certain difficulties exist in the matter of publication, and this has had a deterring and paralysing effect on the laboratory's activity. M. Haffkine's work in India has a world-wide interest, and it is essential that any regulations which hinder the publication of his results should be removed as soon as possible.'

Duprat (*Ann. de l'Institut Pasteur*) reports the results of the treatment of forty-five cases of plague with the Roux-Yersin serum. At the commencement of the epidemic, the doses employed were from 60 c.cm. to 80 c.cm., repeated or not, every twenty-four hours, according to circumstances. Sixteen cases were treated in

this manner, with a mortality of 31·25 per cent. Subsequently this dosage was largely increased up to an initial dose of 300 c.cm. in one case. The results thus obtained were much better than those obtained with the smaller dosage, and the mortality fell to 13 per cent. A number of cases are related, of which the following may be taken as an example: A child aged 10 years, when first seen, had a temperature of 39·80 C., pulse, 130 and compressible, rapid respiration and marked collapse. He could with difficulty be got to answer questions, and had a very painful bubo in the left inguinal region. He received a first injections of 100 c.cm., followed twelve hours later by 120 c.cm., then at the same interval 80 c.cm., and, twenty-four hours after, 60 c.cm. Recovery took place, complicated by general articular pain—a frequent effect of the serum injection. The injections were all subcutaneous, and Duprat comments on the difficulties of Calmette's method of intravenous injection.

The importation of a monthly supply of some fresh Yersin serum from the Lister Institute of Preventive Medicine, London, England, has been continued throughout the year, so that it might be supplied promptly from here to any of your stations where plague should show itself.

The steamship *Bishopsgate* arrived at Newcastle on the River Tyne on the 20th ultimo with bubonic plague on board. The ship had brought a cargo of wheat, maize, and bran from Rosario in the Argentine to Hamburg. On arrival in Hamburg, on August 29, no one on board had plague, but the rats were found infected. The crew were discharged, a fresh crew engaged, the ship fumigated and cleaned. On arrival on the Tyne on September 20, one man was found suffering from plague, from which he is recovering. No other cases occurred on board ship.

Modern Methods of Disinfecting a Plague Ship.—Nocht, of Hamburg, gives the details of the disinfection of the steamer *Cordova,* which arrived from Brazil, December 25, 1903. Every ship arriving at Hamburg is searched for dead rats by the sanitary authorities. During the last year they were found in thirty-six ships and plague bacilli were found twice. When the *Cordova* began to unload, the inspectors found at noon seven dead rats. By three o'clock the ship was notified that the findings were suspicious, and it was ordered to leave the quay and anchor in the open water. The Nocht-Giemsa disinfecting apparatus was installed the same day, and the hold and living rooms were filled with the gas generated. The next morning fresh air was pumped into the hold by the same apparatus, and the unloading of the ship on lighters allowed to proceed. The cargo consisted of sacks of coffee and bran, and as each sack was brought up it was inspected by the sanitary officer. All on which there were signs of rat manure or gnawing were loaded into a separate lighter, which was isolated for a period of two weeks, with no possibility of contamination from other rats, after which the unloading was allowed to proceed without further restrictions. None of the rest of the cargo was interfered with, and it was unloaded and stored in the warehouses as usual. No plague rats were found anywhere in the ship except in the compartment where the first had been discovered, and all in this compartment had died before the gas disinfection. The gas killed 139 rats in all, including a number of nests of young rats in inaccessible crevices. The crew and others working on the ship were required to wear an outer suit while at work, with gloves, &c., and on leaving work to clean their hands and shoes with kresol soap. They were examined by a physician once a day, and for five days after the unloading of the ship was completed. Otherwise they were not interfered with. After the ship had been unloaded it was disinfected anew with lime in the hold and the living rooms with formaldehyde. All the sweepings of the ship were burned, as is compulsory for all ships in Hamburg harbour. In five days from the finding of the dead rats, the sanitary officers withdrew and the ship sailed in two days with a new cargo. A few sacks had been carried into the warehouse before the first rats were found, and they were isolated by covering them with tarpaulins and building a high board partition around them, shutting up in it a couple of trained rat dogs. After the two weeks' period was past the partition

was removed and the sacks not further interfered with. The purpose of these measures was to keep the rats in the warehouse from access to the sacks during the period of isolation. No case of sickness developed among the crew or those having anything to do with the ship.

Destruction of Rats in France.—The ravages caused by the field rats in agricultural districts of France have caused the government to take up the matter. A Bill has been submitted by the government to the Chamber of deputies providing for the issue of bonds to raise $70,000 to be applied to the destruction of field rats. Experiments have recently been made on a large scale in la Charente where a large tract of land—about 3,000 acres—was honeycombed with rat holes. The work was in charge of Danysz and Chamberland of the Pasteur Institute. Cultures of the bacillus which Danysz has found is pathogenic for field rats were spread on bread or oats and distributed in and near the rat holes. Over 10,000 pounds of bread and twice this amount of oats and 1,200 bottles of the virus were used. The results showed that 95 per cent of the rats had been destroyed. The campaign progressed without mishap and no domestic animals were injured.. It is unfortunate that no virus has yet been discovered effectual against the town rat, which is much more resistant. Roux believes that the prospects are bright for this achievement in the near future. The legislation now in progress contemplates that the land owners must pay a certain proportion of the expense of the anti-rat campaign. Rats are not only concerned in the transmission of the plague, but also a trichinosis. Certain epizootics are likewise due to them, as they transmit the germ, although they do not contract the disease.

Cholera.—This disease has appeared during the year in Afghanistan, Borneo, China, Formosa, France, India, Japan, Persia, Philippine Islands, Russia, Straits Settlements and Turkey.

The following note on Mohammedan pilgrimages is from *U. S. Public Health Reports* of the 28th instant :—

'The notification of the sanitary board of Constantinople states that by special regulation applicable to the Mohammedan pilgrimage from the Hedjaz for the season of 1904-5, the lazaret of Camaran has been ready to receive maritime arrivals since September 11, 1904, and will continue in operation until March 7, 1905, this period corresponding to six months of the Mohammedan year. During these six months vessels having pilgrims aboard coming from beyond the strait of Bab-el-Mandeb, no matter what sort of bill of health they carry, must, with the exception of certain craft hereinafter mentioned, proceed direct to the lazaret of Camaran without stopping at any port of the Red Sea. All Mussulmans arriving at the Hedjaz are considered to be pilgrims. Pilgrim vessels are defined as those arriving at the Hedjaz with pilgrims aboard, with the exception, however, that vessels are permitted to carry one pilgrim for each 100 tons net register without falling into the category of pilgrim vessels. The latter class of vessels are treated in accordance with the character of their bills of health and in conformity with the regulations of 1867, applicable to arrivals from cholera-infected places.

'Vessels on which the number of pilgrims embarked is strictly limited to a figure not exceeding five for each 100 tons net register must, at all periods of the year, go to the lazaret of Abou-Saad, near Djeddah, which is in operation the whole year. They will land there all passengers and merchandise bound for the Hedjaz, after which they will be free to continue their voyage. Sambouks and other coasting craft carrying pilgrims are treated as pilgrim vessels. Those which go from one port to another are subject to quarantine at the lazaret of Abou-Saad. On the other hand, those which come from outside the strait of Bab-el-Mandeb must go direct to the anchorage of Camaran.'

Yellow Fever.—In 1901, a commission composed of Messrs. Marchoux, Salimbeni and Simond, of the Pasteur Institute, was appointed to conduct investigations regard-

ing the etiology of yellow fever and the mosquito *Stegomyia fasciata* in the transmission of the disease at Rio Janeiro. This commission rendered a report, which was thus summarized by the *Jour. A. M. Association* in May last :—

'The commission concludes that the infecting principle in the blood of yellow fever patients remains active for five days when kept in defibrinated blood under liquid vaseline, but that at the end of eight days the infectivity of the blood has disappeared. They deduce as a result of their experiments that the blood contains this infecting agent during only the first three days of the disease.

'They deduce further from their experiments that the blood serum of a yellow fever convalescent possesses clearly preventive properties. They further deduce as the result of experiments on eleven individuals made in hospital that the blood serum of a yellow-fever convalescent possesses therapeutic properties of considerable curative value.

'In regard to the mosquito *Stegomyia fasciata,* their work is particularly valuable. They point out that the habits of the *Stegomyia fasciata* differ very much from those of most other mosquitoes. One of the marked peculiarities of the species is its extreme susceptibility to differences of temperature. It manifests its greatest activity when the thermometer stands at 25 C. Beyond 39 C. the insect dies. At 15 C. to 16 C. the insect becomes inert and ceases to bite. At 12 C. to 14 C., it is benumbed and flies with great difficulty. All of the acts of its life are much influenced by the temperature of the surrounding atmosphere.

'The female stegomyia alone bites. The female is perfectly capable of biting immediately after metamorphosis. Within twenty-four hours she bites readily. Within forty-eight hours of metamorphosis and at temperatures between 26 C. and 35 C. she will bite readily at any hour of the day if recently fecundated, but especially beginning at about 11 o'clock in the morning. If the temperature is between 19 C. and 25 C., she bites less readily. At temperatures between 14 C. and 18 C., she does not seek to bite at all unless artificially warmed by contact with the skin of the victim. She bites less readily between 22 C. and 25 C., but a temperature of 27 C. to 30 C. is that which suits the insect best.'

The general conclusions of the commission may be summed up as follows :—

1. The serum of a patient on the third day of the disease is virulent.

2. On the fourth day of the disease, yellow fever blood no longer contains any virus, even when the fever is high.

3. One-tenth of a cubic centimeter of virulent serum injected under the skin is sufficient to cause yellow fever.

4. The virus of yellow fever rubbed on a blister of the skin, made by removing the epidermis, does not give the disease.

5. In the serum of the patient, the virus of yellow fever passes through a filter Chamberland F without dilution.

6. Under the same conditions it does not appear to pass through filter B.

7. Virulent serum preserved exposed to the air at a temperature of 24 C. to 30 C., is inactive at the end of forty-eight hours.

8. In defibrinated blood, preserved under liquid vaseline at a temperature of 24 C. to 30 C., the microbe of yellow fever remains living for five days.

9. At the end of eight days defibrinated blood, kept under the same conditions, no longer contains active virus.

10. The virulent serum becomes harmless after heating for five minutes at 55 C.

11. A preventive injection of serum heated for five minutes at 55 C., confers a relative immunity which, followed by inoculation with a very small quantity of virus, may become complete.

12. The injection of defibrinated blood, kept in the laboratory under liquid vaseline for eight days at least, confers a relative immunity.

13. The serum of a convalescent is endowed with clearly preventive properties.

14. The immunity conferred by the serum of the convalescent is still in evidence at the end of twenty-six days.

15. The serum of a convalescent appears to have the therapeutic properties.

16. As has been proved by Reed, Carroll and Agramonte, yellow fever is produced by the bite of the *Stegomyia fasciata.*

17. To be able to produce the disease in man, this mosquito must be previously infected by absorbing the blood of a patient stricken with yellow fever during the first three days of the disease.

18. The infected mosquito is only dangerous after an interval of twelve days from the time when it has ingested virulent blood.

19. The bite of two infected mosquitos may cause a serious illness.

20. The mosquito appears to be more dangerous in proportion that her bite is delayed after the time when it has become infected.

21. The bite of infected mosquitoes does not invariably give yellow fever.

22. When the bite of infected mosquitoes has been without effect, there is no immunity conferred against the injection of virulent serum.

23. In the neighbourhood of Rio de Janeiro, as in Cuba, no other mosquito than the *Stegomyia fasciata* is concerned in the transmission of yellow fever.

24. Contact with a patient, his personal effects, or his excretions, is incapable of producing yellow fever.

25. Outside of the bite of the infected stegomyia, the only means known of producing the disease is the injection into the tissues of a susceptible individual of blood from a patient collected in the first three days of the disease.

26. Yellow fever can only assume a contagious character in regions where the *Stegomyiæ fasciatæ* prevail.

27. The prophylaxis of yellow fever rests entirely on measures taken to prevent *Stegomyiæ fasciatæ* from biting the individual sick and then a healthy individual.

28. It must be borne in mind that the period of incubation of yellow fever may be prolonged up to thirteen days.

29. The Stegomyia fasciata is frequently infected by moulds, yeasts and by sporozoa. No parasite of this species recognized up to this time has any causal relation to yellow fever.

30. Neither in the mosquito nor in the blood have we succeeded up to this time in discovering the casual agent of yellow fever.

Observers disagree as to its hours of feeding, but the disagreement is more apparent than real. All agree that its principal time of flight is in the afternoon : It is 'essentially crepusoular.' Reed says: 'after four o'clock.' The New Orleans Commissioner : 'especially in the afternoon hours.' The Vera Cruz Working Party states 'early in the morning and late in the afternoon.' It does not feed in the dark nor does it in a strong light, and its feeding seems more dependent on the degree of light than on the time of day. If the place be fairly light it approaches its victim on the shadow side, thus especially attacking the ankles under a writing table, or the hand under the head during siesta. It bites after dark if there be artificial light in the room. It does not bite out of doors in ordinary bright daylight.

The above habits, together with the fact of its being a house mosquito and the infected insects being mainly confined to dwelling houses, explain the comparative safety of 'day-light communication,' *i.e.* entering a town only after 10 a.m., and leaving by 4 p.m. under pledge to go in only on sunny days and to enter no residence ; sometimes not to go into the residence portion of the city. The danger of staying all night was really the danger of the late afternoon, early evening, and morning hours spent, of course, in residences.

A recent writer thinks from his observation afloat on salt water in the lee of islands and mosquito-infected shores that the Culex of the salt marshes is quite frequently carried considerably over a mile by light, steady breezes, long continued.

Is this true of the Stegomyia ? It is a far lighter insect, more fragile and apparently with very little wing power. It probably never flies high. It is found, by preference, in the lower stories of houses, and would thus be little liable to conveyance by wind, and its feeble power of flight should prevent its passing over any considerable distance by its own wing power. Nearly two years ago, the writer suggested that this problem be taken up, it being of importance in determining the anchorage of vessels in yellow-fever ports. So far he knows of no direct observations on this subject, except those of Goldberger at Tampico, and of Grubbs at Ship Island Quarantine. The latter found Stegomyiæ aboard three vessels from Vera Cruz, two of which claimed to have lain a half mile from shore. He believed they came aboard at Vera Cruz. The observation of Goldberger will be given later.

Although direct observations on this problem are few, yet there are certain indirect ones, bearing, however, entirely on the aerial conveyance of the Stegomyia infected with yellow fever. It is notorious that yellow fever is usually conveyed but a short way aerially, across the street,' or, more often ' to the house in the rear,' which is about as far as it was expected to be thus conveyed. This represents a maximum distance of about 75 yards. The two longest distances recorded in recent times of aërial conveyance, one of 25 meters (Mèlier) and one of 76 fathoms—456 feet (the writer) are entirely exceptional. So much for the distance which the (infected) Stegomyia is conveyed—or rather usually conveyed—aerially.

On the other hand it is known that vessels moored in certain districts of the Havana harbour did not develop yellow fever aboard, except in those who had been ashore, or unless they lay close to other vessels which were infected. This experiment has been made on so large a scale—with so many vessels and for so many years —that we must accept as a fact that an infected Stegomyia was not conveyed aerially from the Havana shore to those vessels, or, allowing for errors, was very rarely so conveyed. The distance which had been found safe was something over 200 fathoms —1,200 feet. The prevailing wind was generally slightly on shore, but was not constantly blowing. Whether there is any difference in the distance to which infected or non-infected mosquitos are conveyed, is, of course, entirely a matter of surmise. There is no apparent reason why there should be. Yet the infected Stegomyiæ have almost certainly become so in a house ; and with their very domestic habits must be found out of doors, where they would be subject to conveyance by the wind, in much smaller numbers than the uninfected insects, and consequently a lesser *number* of them would be conveyed aerially. Observation is needed on this subject—the distance (across water) that Stegomyiæ are aerially conveyed.

Goldberger, very ingeniously, suggests that on acount of its diurnal flight, the direction of the wind during the day only need be considered in estimating this factor in its aerial conveyance, and states that at Tampico he has failed to find Stegomyiæ aboard vessels lying, for ten or fifteen days, about half a mile from a shore where they were abundant, while numbers of Anopheles albipes and Culex pungens were found. The wind was on shore during the day and calm or off shore during the night. The importance of this point is obvious.

This disease has been present during the year in Brazil, Columbia, Costa Rica, Cuba, Ecuador, Mexico, Panama, Peru, Venezuela and Curaçao, in the West Indies.

In Havana, no case of yellow fever has originated since September, 1901, since which time the city has been entirely exempt from the terrible disease, that had there kept stronghold for a hundred and fifty years. Cases are now admitted into Havana from Mexican ports, but are treated under screens with perfect impunity, in the ordinary city hospitals. The crusade against the insects also caused a very large decrease in malarial fevers.

The destruction of the most fatal epidemic disease of the western hemisphere, in its favourite home city is but the beginning of the benefit to mankind that may be expected to follow the work of Reed and his associates. There can be no manner of doubt should Mexico, Brazil, and the Central American Republics, where the disease

still exists, follow strictly the example set by Havana, that yellow fever will become extinct and the United States forever freed from the scourge, that has in the past slain thousands of its citizens and caused the loss of untold treasure.

More recent investigations into the cause and spread of yellow fever have only succeeded in verifying the work of Reed and his commission in every particular and in adding very little to our knowledge of the disease.

Later researches by Guiteras in Havana, by the Public Health and Marine Hospital Service in Vera Cruz, and lastly by a delegation from the Pasteur Institute of Paris in Rio de Janeiro, all confirm in the most convincing manner, both the accuracy and comprehensiveness of the conclusions of the United States commission.

Small-pox.—This disease has prevailed extensively throughout the year appearing in Africa, Argentina, Austria-Hungary, Belgium, Borneo, Brazil, Canada, Chile, China, Columbia, Cuba, Ecuador, Formosa, France, Germany, Great Britain, India, Italy, Japan, Java, Mexico, Netherlands, Panama, Peru, Philippine Islands, Russia, Spain, Straits Settlements, Turkey, and the United States.

The epidemic of this disease in the United States, which has prevailed for the last four years, is diminishing greatly in both extent and virulence. In United States Public Health Reports the number of cases during the first six months of this calendar year is given at 11,367, and from July 1 to the 28th instant as 3,462. Last year the figures for similar periods were 26,937, and 10,469.

During this month there has been an outbreak of this disease in Chicago, which it is thought may be attributed to infected warm clothing put carelessly away last spring and taken out again now that the cold weather has returned. Dr. A. R. Reynolds, Commissioner of Health of Chicago, in a bulletin dated the 29th instant, reports as follows :—

'Upward of 270,000 vaccinations have been performed in the city since the first of the month—forty-odd thousand by officers of the department and the remainder by private physicians.

'Twelve new cases of small-pox were discovered during the week, but no new centre of infection; they are all traceable to the previous cases. Of the twelve only two had ever had vaccination even attempted; these two, 31 and 55 years of age respectively, exhibit old, imperfect scars made in childhood.

'Of the 45 cases in the Isolation Hospital at the close of the week 17 are unvaccinated children under the school age, 6 years. The figures are the sufficient argument for the school vaccination requirement. Not one case of small-pox has ever occurred among the hundreds of thousands of scholars in attendance in accordance with this requirement. On the other hand, there have been a number of cases, some fatal, in scholars admitted on false certificates of vaccination, fraudulently given by venal doctors. Such men are a disgrace to the profession; they are guilty of constructive homicide in every fatal case, and deserve the punishment therefor.

'While there are a number of severe cases under treatment it is believed all will recover—even the baby born with the disease and vaccinated twenty minutes after birth.'

The threatening of this disease being imported from the United States has lessened so much from dying out of the disease as an epidemic in that country that the last of your international frontier small-pox inspectors were withdrawn at the end of July.

In the North-west Territories some cases occurred during the year. Dr. Patterson, your very efficient officer for the Territories, now reports that there have been no cases for the last ten weeks, and that the disease as an epidemic has for the time at any rate ceased to exist.

This disease has also been brought to some of your maritime quarantines.

In each case the disease was stamped out at the station, and no subsequent consequent case occurred inland.

Small-pox prevention in Germany.—The *Medical Record* thus writes on this subject :—

'Many of the opponents of vaccination contend that the chief reasons small-pox has so greatly decreased are the general adoption of more efficient sanitation and the strict isolation of those suffering from the disease. When Germany is pointed to as a conspicuous example of the benefits of vaccination, these unbelievers say, but this result is not so greatly due to vaccination as to isolation. The British Local Government Board recently resolved to investigate the matter, and to decide as to whether isolation has been the main factor in practically driving small-pox out of Germany, or whether to vaccination must be given the credit for this desirable state of affairs. Accordingly Dr. Bruce Low, one of the inspectors of the board, was despatched to Germany some few months ago with instructions to make a thorough investigation of the small-pox question. Dr. Low has performed the duty placed upon him, and has just published a report in which all the aspects of the situation are dealt with.

'At the very outset the reporter met with a serious but suggestive practical difficulty. In Berlin, where he went first, he could hear of no small-pox in Germany. The Central Health Office knew of none, but to help him in his inquiry it was arranged that he should visit representative towns in the four chief States of the German empire—Prussia, Bavaria, Saxony, and Würtemberg. The towns visited were ten—in Prussia, Berlin, Cologne, Frankfort-on-Main, Wiesbaden, and Mainz; in Bavaria, Munich, and Nuremberg; in Saxony, Dresden, and Leipzig; and in Würtemberg, Stuttgart. And so Dr. Bruce Low started on his quest through these towns, with a total population of nearly 5 millons. But it appears that from beginning to end he could not find a small-pox case in any of them. As a matter of history, indeed, the disease was known. In Berlin, there had been some 70 cases in seven years (1895-1901 inclusive) ; in Cologne, one case in 10 years ; in Frankfort, 9 fatal cases in 10 years; in Wiesbaden, 12 cases eleven years ago, but none since then; in Mainz, apparently none during eleven years; in Munich, 7 cases in eight years; in Nuremberg, none for about eleven years; in Dresden, no deaths for the past ten years; in Leipzig, 5 cases in eight years; and in Stuttgart, none in six years. The record is truly a wonderful one. There is nothing to be found like it anywhere else in Europe.

'As regards the small-pox which did occur in Germany, the amount of it due to foreigners is quite remarkable. Russia, Austria, and Italy are the principal contributors, and many of the outbreaks are near the Russian and Austrian frontiers. Dr. Bruce Low's notes on the ten towns he visited are very striking in illustration of the importance of foreign sources of infection. In Berlin, it has been already stated that about 70 cases ocurred in seven years. There were outbreaks in five of the seven years, and in every outbreak the origin of the infection was traced to foreigners—Russians, Italians, Austrians, Portuguese, and in one case to a group of performing negroes from Togoland. In Frankfort, the disease was twice introduced from Russia. Dresden is within thirty miles of the Austrian border, and thence receives its small-pox. Of 8 persons attacked at Leipzig in eight years, 2 were Russians and 4 Austrians.

'The law of Germany with regard to vaccination, is, as is well known, extremely strict and stringently enforced. This law requires infants to be vaccinated before the end of the calendar year following the year of the birth, and all school children to be vaccinated in their twelfth year. The notification of small-pox is obligatory throughout the Empire, and all persons suffering, or suspected to be suffering, from small-pox can be ordered to hospital for isolation if, in the opinion of the medical officer of the local authority, the patient cannot be properly isolated at home. On the occurrence of a case of small-pox in a house, the "contacts" are immediately vaccinated or revaccinated; and in some towns they are removed to a place of isolation until the time for the development of the disease has passed away. The provision for "isolation" is nowhere of such a kind as would satisfy English practice or requirements.

'The truth is that the whole German system of small-pox treatment and so-called "isolation" is dominated from beginning to end, and from centre to circumference,

by the great fact of the vaccination and revaccination of the people. The population, as a whole, is practically insusceptible to small-pox, and this consideration is supreme in every step taken in dealing with the disease.

'Dr. Low's general conclusion is that the German plan differs markedly from that employed in England and Wales by reason of the character of the so-called isolation. Untoward results to other persons from bringing small-pox to the sites of the general hospitals, have been seldom observed, and this, in Germany, is with one consent attributed to the protection afforded by statutory vaccination and revaccination, without which it is unanimously admitted that the method would break down. With this assistance Germany is able to dispense with separate small-pox hospitals and with any separate administration for the purpose of providing against the disease, and is thus freed, not only from a great expense, but from the suffering and inconvenience entailed upon England and Wales by the costly and half-hearted methods of dealing with epidemics as they arise, instead of preventing them from arising.

'The instance of Germany, with reference to the methods in vogue there for the prevention of small-pox, is a conclusive proof that vaccination and revaccination, carried out thoroughly and conscientiously, confers so great an immunity against small-pox that other means of dealing with the disease are rendered superfluous. It would be well if other nations were to take the lesson taught by Germany to heart and follow in her footsteps. There are times when the objector to vaccination, however conscientious, must be ignored and his principles must be sacrificed for the public good.'

Red light treatment of Small-pox.—Dr. Niels R. Finsen, who reintroduced this ancient treatment and has been the pioneer in modern scientific phototherapy died, September 24, in Copenhagen, aged 43. He was a native of the Faroe Islands. He began his work while a student in the Copenhagen University, from which he was graduated in 1890. Three years later he published an article on 'The Influence of Light on the Skin,' which aroused general attention because of his assertion that small-pox could be cured by the red-light treatment. This was but one application of the Finsen theory that light rays contained healing powers, and to develop the positive element of his theory he began experimenting with concentrated artificial light rays. As a result of his experiments, he effected a cure for lupus vulgaris. This cure directed great attention to the young investigator, and in 1896, the Municipal Hospital of Copenhagen allowed Professor Finsen several small buildings on its grounds in which to carry on his experiments. The Danish government then became interested in the support of the institution, and this support enabled the institute to be removed to Rosenvaenget, a suburb of Copenhagen, where under the direction of Professor Finsen, with a staff of scientists of national repute, expert electricians, and trained nurses, many cures of cases previously deemed incurable were made. In December, 1903, Professor Finsen was awarded the Nobel prize. For several years he had suffered from dropsy resulting from heart disease, but so intense was his devotion to his work that he hardly spared time from his studies for sleeping and eating, much less to recuperate his health. His death is attributable to an aggravation of the diseases from which he had suffered during his entire adult life by reason of his persistent overwork.

Leprosy.—In an article in the *British Medical Journal* under date the 17th of last month, Dr. T. J. Tonkin, late Medical Officer Hansa Association Central Soudan Expedition writes as follows on the curability of this disease :—

'For myself I have no hesitation in saying that I believe leprosy to be a disease that often yields to the influence of improved circumstances, whether that improvement be the result of wise supervision in an institution or a fortunate course of events outside.

'In this respect, leprosy closely resembles tuberculosis. There are few who would care to dispute the fact that many recover from the latter disease. One has only to

have the opportunity of following a series of autopsies to know that the lungs of a considerable proportion of persons who die at advanced years, and of ailments in no way connected with tuberculosis, present, on examination, evidence of pre-existent tuberculous disease. The slowly calcifying caseous focus, or the fibroid patch, shows that they have been so affected; but the condition of these things—the caseous focus rigidly cut off from the surrounding healthy tissue, and the fibroid patch pale and hard, when taken with the age, appearance, and history of the person in question—leave no doubt that they are but the ashes of a long-dead fire.

'What are the circumstances which, in any given instance, have determined this course of events we can, as a rule, only speculate. This much, however, we can usually be sure of, that at some time or other, when the person was in a lowered condition from poverty, business worry, previous illness, vicious courses, or any other of the hundred-and-one everyday things that depress our vitality, he was exposed to the infection of tuberculosis. The man's extremity was the bacillus's opportunity. As a result he became the subject of definite tuberculous disease. Then, after a period of dejection of mental and physical powers—a period during which the disease made headway—something happened, and the tide turned. Perhaps it was a rise in wages that determined it, or the removal of some source of trouble; but, whatever may have been its particular nature, it was something that lifted the man up again—allowed his vital forces to rally, and helped them to face and defeat the invading influence. Unfortunately, these vital forces, however thoroughly they may be reawakened, are often unequal to the task of repairing the actual damage done by the operations of the invader; but they can, and do, bottle it up and strangle and starve it, so that in time, from being a centre of action hostile to the system, it becomes a mere passive encumbrance—in the way, perhaps, but more or less powerless for evil. You may call such a man phthisical if you like, and if you happen to have known the nature of his previous malady; but if febrile reaction, emaciation, night-sweating, cough, and bacillus-laden expectoration have left him, and his capacity for work and pleasure has returned, you may call him what you like; you will not make him a sick man or a danger to the community.

'It is much the same with leprosy. Since the days of Moses leprosy has been regarded as incurable, and the word "incurable" has in this instance acquired the force of a formula conveying the idea of a thing incapable of betterment—past help, hopeless. But there are other ways of reading the word. Incurable leprosy certainly is in the sense that we do not at present possess—and possibly never may possess—a remedy that affects its course as dramatically as mercury and the iodide of potassium affect that of syphilis, or as antitoxin affects that of diphtheria. But it is difficult to regard it as incurable in any other sense. The course of events I have just sketched in connection with tuberculosis is often followed by leprosy. The disease, contracted is the result of an exposure to contagion rendered effective by the depressing influence of adverse circumstances, is often recovered from when those circumstances are removed. The application of a knowledge of this eminently natural course of events is what I call intelligent treatment of leprosy, and its successful issue I call cure. Leprosy is a disorder of which every grade exists. In any endemic area where one person suffers severely, many are subject to slighter degrees, from which they may recover without doing more than, or in some cases even so much as, suspect the nature of their malady. And among those who take the disease more severely the supervention of some improvement in their circumstances almost always betters the condition of the individual, and in an appreciable proportion of the cases abolishes the disorder.

'One of the greatest obstacles to the recognition of the true state of affairs with regard to this matter has undoubtedly been an imperfect understanding of the actual condition of many persons supposed to be lepers. To the average individual, whether medical or lay, a person with no fingers or toes and an abbreviated nose is a leper, no matter what his condition of health may be otherwise. But a man is not necessarily still a leper because he happens to be mutilated.

'The figures of any table arranged to illustrate the duration of the disease will help to make this clearer. I quote one of my own because I am best acquainted with it. The table I allude to gives in periods of five years the time that in each of 220 cases had elapsed since the onset of the disease. The average period over which fatal leprous disease extends does not usually exceed a dozen years. The last figures I had to do with in connection with this matter gave ten as an outside limit. To give the thing fullest play, let us make it fifteen. If a person have survived the invasion fifteen years, it is highly probable that his disease will be in an exceedingly quiescent condition, while if twenty have elapsed the signs will often be of so indefinite a nature as to defy recognition. Of the 220 cases I have just quoted, 24 per cent had survived the fifteen years' limit, while 8 per cent had left the date of invasion periods, varying from twenty to fifty-five years, behind them. There are exceptions, of course ; but in a large number of these cases it will be found that all specific leprous manifestations have been left behind also. Their effects may remain; naturally the fingers and toes that have been lost will not grow again ; but you can no more reasonably, on that account, look on a man as suffering from leprosy when he may have enjoyed previous to the date of his examination anything from five to fifty years of unbroken health, and when his capacity for labour is only limited by the destruction of tissue resulting from the pre-existent disease, than you could reasonably regard the man with the calcifying focus or fibroid patch as necessarily suffering from tuberculosis.

'At this point in the discussion of the subject, the objection is often made that it is impossible to be sure that any given individual is really cured. It is suggested that, although he may seem to be cured, it cannot be regarded as certain that he has no lepra bacilli inside him. I readily concede this. But I do not see any pressing necessity for knowing whether he has lepra bacilli inside him or not. He may have them in him—indeed, I should say there is little doubt he very often has—and yet he may not be suffering from leprosy. The presence of lepra bacilli in a man's tissues does not necessarily make that man a leper. The term "leprosy" is only properly applied when it is used in connection with the reaction that takes place between the constituents of the bacilli and those of the tissues they invade. While that reaction is in being the individual affected is suffering from leprosy ; as long as it is in abeyance, or after it has died down, it cannot be considered that he is. If some bacilli are there—and in a recent letter I am informed by Dr. Hansen that he has found them in the spinal cord fifty years after invasion—they are there on much the same terms as such tubercle bacilli as may remain in a caseous focus of long standing. In appearance and reaction to the various stains they may be indistinguishable from the organism in an active state, but their vitality is nevertheless open to doubt, and their influence under the circumstances in question is almost certainly *nil*. It is probable that, for the time at least, they are negligible quantities. It cannot matter much whether they are there or not. If the man be devoid of the signs and symptoms of the active disease, if his organs are performing their functions in an ordinary fashion, if he enjoy life and can work, I hold it is rational to look on that man as hale, and if the accessible fluids of his body are free from bacillary pollution he can hardly be regarded as a danger to the community.'

'That in this sense leprosy is curable there can be little doubt, for many individuals of this description are living. It is important to recognize the curability of the disease, for if this fact is not recognized a community will not be apt to look with favour on an asylum for lepers which discharges its patients. If this disease is considered incurable, it is not likely that any educational movement will be instituted to correct the prejudices of the people. Again, the patient himself, in the institution, believing himself to be beyond hope, will not avail himself of any of the aids which in the early stages of the disease offer such golden opportunities for treatment. Owing to this general belief, large numbers of leprous persons are rendered ineffective as wage-earners. Taken early it is possible that the man can not only be

cured, but that he will be able to go back again to take his original place in the world. The writer finally speaks of the responsibility of the medical profession in this matter, which he believes is not small.'

Mr. Jonathan Hutchinson in discussing Tonkin's paper said he had himself long ago taught that there was a natural tendency to cessation of all active processes if the patient lived long enough, and that in this respect leprosy resembled tuberculosis. That its active stages were self-terminable was part of the definition of leprosy which he had recently given in the *Clinical Atlas* of the New Sydenham Society. Its closest analogy was, he believed, with lupus erythematosus, a malady which after a few years' activity always tended to spontaneous cessation. He was now in a position to assert as to leprosy that in the cases in which recovery had taken place there was usually no tendency to relapse. The bacillus appeared to exhaust its soil and to be incapable of indefinite prolongation of its life. He had seen cases in which a period of fifteen or even five and twenty years had passed since the disease was apparently cured and in which there had not been the slightest return. Such patients usually regained good health. Nor was it only in slight forms or in the maculo-anaesthetic type that recovery ensued. A case which he had brought before the Medico-Chirurgical Society in 1878 was an example of recovery from a severe tubercular form, and he might now add respecting that case that the patient remained in good health many years after the date of publication of her case. Mr. Hutchinson here produced some photographs of a well-marked tuberous case in which recovery was in progress. In connection with it he took occasion to remark that the influence of chaulmoogra oil in expediting the recovery appeared to have been very definite. The result of his inquiries in India had been to greatly increase his estimate of the value of this oil, and he was inclined to rank it as far superior to all others. It appeared to possess real power in arresting the vitality of the bacillus, and he would strongly urge its more extended trial, not only against leprosy, but against its close congener, tuberculosis. It was a remarkable fact, if the proposition were accepted that leprosy was a spontaneously curable disease, that the opposite opinion should have been so generally prevalent. There was, however, he believed, a very simple clue to the apparent discrepancy. Leprosy was incurable and for the most part fatal if the patient remained in the country in which it had originated; it was curable if he left it. It was from Norway that we got the strongest expressions as to uselessness of all drugs and the incurability of the disease. There it was said that cases of apparent recovery in hospital relapsed when sent home. The explanation was simply that, in returning home, the patients returned to the dietary which originally caused the disease. They resumed a dietary which consisted largely of fish, and it could not be wondered at that they relapsed. Although probably it was only fish in certain peculiar conditions which could originate leprosy, yet when once the disease was established, almost all forms of fish might tend to feed it. Many observers had noted that fish food made leprosy worse. All observations as to the curability of leprosy and as to the influence of drugs upon its course were, he believed, quite valueless unless abstinence from fish were enforced. In Norway, where the peasants live on fish, and fish was supplied in the asylums, the disease was severe, and was held to be incurable; in India and Ceylon, where fish was not abundant, it was mild and often curable; in Natal, where no fish was to be had, it did not spread, and was for the most part mild, and followed by recovery.

Dr. Smith, your officer at Tracadie, writing to me on this subject says: In L'Ameque and in Pointe Marcil, our only leprous districts, the people select inferior codfish—fish that have been eaten down the back by maggots—as their winter food, selling the good fish to the merchants.

In opposition to this asserted connection between the eating of tainted fish and leprosy, Dr. H. Trail Skae writes as follows :—

'Mr. Jonathan Hutchinson is reported, in the *British Medical Journal of* September 26, 1903, pages 702-3-4, as saying : (1) That certain communities, in-

cluding Orkney and Shetland, engaged in fishing formerly suffered greatly from leprosy ; (2) that in Orkney and Shetland the disease underwent gradual extinction without the assistance of segregation laws ; (3) that the methods of curing fish have greatly improved ; (4) that no tainted or decomposing fish is now eaten in any part of the British Isles ; and he gives the last two points as sufficient reason for the second.

'So far as Orkney and Shetland are concerned, I venture to entirely dispute the accuracy of the statements 3 and 4, and more particularly the latter.

'In Orkney and Shetland fish still forms the staple article of food. At the present day it bulks more largely in the diet than it did generations ago, when large quantities of wild fowl were consumed. And of this fish a very large proportion can only be described as tainted or decomposing.

'"Skate" are usually simply cleaned and then hung in the open air, exposed to all kinds of weather, and never properly dried. They commonly hang for weeks—sometimes longer—until phosphorescent, sour, and almost unapproachable, a slice being cut off from time to time as required, and boiled for a period rarely exceeding twenty minutes. Until recently it was not uncommon to see people eating the fish in this condition without any cooking whatever.

'Sillocks and "kenithes" are soaked for days in plain water, or with a mere trace of salt, until perfectly soft and rotten. They are then cleaned and pressed, or hung in the open air—never properly dried. Vast quantities of them—known locally as "sour sillicks"—are eaten, as often as not without any cooking, in a state which would grievously alarm Mr. Hutchinson.

'Cod and haddock, caught locally or landed from passing trawlers, are left for days lying uncleaned in plain or slightly salted water, until the smell is disgusting, and the fish so soft that the finger might be pushed through them. They are then cleaned and split, salted and dried—very rarely thoroughly—in the open air.

'The salting, however, is a mere disguise, in no way preventing or curing the putrid condition, which makes itself very evident if the fish be soaked or boiled. These fish are generally eaten after being boiled for a period varying from ten to twenty minutes.

'Large quantities of cod and haddock are simply cleaned and then hung in the open air to be used as required. After a few days they become quite unmistakably putrid. They are then known as "sour cod," etc., and in this condition are greatly liked.

'I have repeatedly had "fresh" herring brought to me in a state of decomposition—perfectly soft and putrid, but nevertheless readily eaten and much relished by the peasantry here.

'These are not exceptional cases. There are actually enormous quantities of fish in this condition eaten in Orkney and Shetland every year. I find the older inhabitants almost unanimous in the opinion that fish is not in any way better cured here now than it was fifty years ago. It is difficult to believe that it could have been much worse. Of course there is a lot of properly cured fish prepared in Orkney and Shetland, but the greater part of this goes south, while the uncured and decomposing, and the sour or badly cured fish is eaten locally.

'I am not aware of any case of leprosy having occurred in Orkney or Shetland within living memory.'

Cases of leprosy in which the disease has been cured, or in which at least all action evidences of its progress have been arrested have been also cited by Dr. Isadore Dyer, of New Orleans, in charge of the Louisiana Leper Home. And from our own Tracadie Lazaretto it has been possible to discharge under surveillance one of the patients who is temporarily at least cured to an extent that prevents his infecting any persons with whom he may come in contact.

The Chaulmoogra oil treatment has been continued during the year at the Tracadie Lazaretto with satisfactory results, all the patients benefiting by it more or less, and in addition to the lessening of tubercles and tendency to healing of ulcerations

there was a general assurance to me during my visits of inspection that they felt the stronger and better from the use of the oil.

Beri-beri.—With reference to the question as to the causation of this disease, and the possible influence of eating damaged rice, Dr. Watt, your officer at William Head, writes as follows about the British ship *Senator* : 'This ship arrived here (William Head, B.C.) 66 days out, from Cebu, P.I., with the captain ill with beri-beri, and two others of the crew convalescent from the same complaint. The first mate was reported as having died of dropsy after one month's illness, which began with him one week out from Cebu. From the history I obtained of this case, I concluded that this also was a case of beri-beri. I inquired concerning the food supply and was informed that all supplies as well as water had been taken in at old country or Australian ports. But on further questioning I found that one sack of Chinese rice had been bought in Cebu and used on the cabin table. All the cases of sickness had occurred among those eating in the cabin, so I think that this one sack of rice can be held accountable for all the trouble.'

This disease has been prevailing in the Japanese army. The wet weather fomenting the rice produced much beri-beri amongst the troops. The number of cases from June to September was nearly 16,000. Referring to this the *Journal of the American Medical Association,* on the 15th instant remarks :—

'The appearance of beri-beri (beri is Singhalese for weakness) among the soldiers now engaged in bloody conflict in the far east calls our attention to a hitherto little noticed and, therefore, so to speak, new terror of war over which medical science as yet has little or no power. Beri-beri (or kakke, as it is called in Japan) is the pest par excellence of the Malay archipelago and peninsula, but given certain special conditions, it may occur apparently almost anywhere, as witness its occurrence among Newfoundland fishermen and in British prisons. It is widely disseminated in many tropical countries, including the Philippine Islands.

'From the clinical and anatomical points of view, beri-beri may be described briefly as a peripheral neuritis, with changes in the central nervous system. Naturally, the disease may manifest itself in varying degrees of intensity ; its manifestations will also vary greatly in the different periods of its evolution. For these reasons various classifications have been proposed, and of these the one by Hamilton Wright recommends itself especially for its comprehensiveness and simplicity. Wright separates beri-beri into three principal forms, namely : 1. Acute pernicious beri-beri. 2. Acute beri-beri (running a course of from three to six weeks, leaving the patient paralyzed). 3. Beri-beri residual paralysis.

'Any one at all familiar with the clinical picture of acute peripheral neuritis and its consequences can readily reconstruct in his own mind the general clinical aspects of the second and third forms outlined in this grouping. Acute pernicious beri-beri—the first form—may terminate life quickly.

'Its main symptoms are great dyspnœa, cyanosis and cardiac failure, symptoms that indicate that in this form the process attacks specially the nerves concerned in respiration and cardiac function. In some forms of acute beri-beri there may be a pronounced anasarca (wet beri-beri), and pernicious symptoms may arise in the course of such cases even when the progress appears satisfactory. Hence the prognosis in the acute forms of this disease, especially when associated with œdema, is uncertain. So far as known, the course of the disease cannot be materially modified by treatment. The gross appearances presented by the organs after death are not strikingly or positively characteristic of any single disease, so that, without the knowledge of the clinical history, it is not likely that a correct diagnosis of acute cases would be made post-mortem without microscopic study of the nervous system, the central, and especially, of course, the peripheral. There may be more or less œdema for which it might be difficult to account in the presence of normal kidneys and normal though dilated heart. Hamilton Wright lays great stress on the presence

of congestion and erosion of the pyloric end of the stomach and of the duodenum, which are said to be constant in the acutely pernicious cases. Wright regards these lesions as the result of the localization of the unknown microbic cause of the disease, which here develops a readily absorbable and powerful neurotoxic substance.

'Wright's interesting and plausible hypothesis as to the etiology of beri-beri was discussed in these columns of *The Journal*, May 21, 1904. The hypothetical organism does not seem to have been described as yet, and it is sincerely to be hoped that this new theory does not only add one more to the long list of theories already advanced to explain the pathogenesis of this disease, which Manson says has been attributed to all sorts of causes : "to damaged fish, damaged grain; to rain, wind, heat, cold; to rheumatism, and many other things, including malaria." Still, in view of the large number of poisonous substances known to be capable of producing multiple neuritis and central nervous changes—lead, arsenic, copper, zinc, ergotin, alcohol, phosphorus, carbonic oxide and sulphide, chick-pea, bad maize, and the products of many microbic infectious agents as seen in the cases of primary and secondary infectious neuritis—it would hardly be surprising if it turned out that the term beri-beri as now used includes a variety of processes due to different causes. Certainly nervous tissues have a remarkable affinity for many harmful substances of diverse nature and origin.

'The reactions between the components of nervous tissues and such substances now demand investigation, especially from the chemical side, if we are to understand better the mechanisms that lead to such grave disturbances in the structure and function of the nervous system. All additions to our exact knowledge of neuritis of whatever cause will help to unravel the difficult problems connected with the etiology, treatment and prevention of beri-beri. At the present time progress in these directions appears to hinge largely on the determination of the question whether the disease is microbic in nature or due to faulty hygiene and bad food.'

Tuberculosis.—The Royal Commission appointed in August, 1901, and consisting of Sir Michael Foster, K.C.B. (Chairman), Professor Sims Woodhead, Professor Sidney Martin, Professor J. McFadyean, and Professor Rubert Boyce to investigate the connection between human and animal tuberculosis and to test the correctness of Koch's uttered opinions has reached certain conclusions that it feels justified in giving to the public, and which, in fact, refute the claim of the distinguished German bacteriologist. They say, according to the report : 'We have most carefully compared the tuberculosis set up in bovine animals by material of human tuberculosis, to that set up in bovine animals by material of bovine origin, and so far we have found the one, both in its broad general effects and in its finer histological details, indentical with the other.' According to the judgment of the commission, therefore, it would be unwise to modify legislative measures on the presumption that human and bovine tuberculous bacilli are specifically different or that the disease caused by the one is different from that due to the other. This is not the final official report, which will give detailed particulars, but so far as it goes may be depended on.

At the annual meeting of the Canadian Association for the Prevention of Consumption, held in this city on April 20 last, an address was given by Mazyck P. Ravenel, M.D., Assistant Medical Director of the Henry Phipps Institute, Philadelphia, on Animal Tuberculoses and their relation to Human Health. In the course of this address he said :—

'Rabinowitsch and Kempner found that ten out of fifteen cows, which reacted to tuberculin but showed no evidence of udder disease gave milk containing tubercle bacilli. They conclude that "milk may contain tubercle bacilli; first, in beginning tuberculosis, without discoverable disease of the udder; and, second, in latent tuberculosis that can be detected only by the tuberculin reaction;" also, "milk from cows that react to tuberculin must be suspected of being infectious in every case."

'Conclusion.—At the present time the weight of the available evidence is in favour of the view that the chief source of infection in children, as well as in adults,

is the human tubercle bacillus, and that the portal of entry is the respiratory tract. It has, however, been proven conclusively that the bovine tubercle bacillus is responsible for a certain proportion of the deaths from tuberculosis in children, and there is strong evidence at hand to show that the number of children infected from bovine sources is quite large. Whether the number be large or small, it is none the less our duty to guard against the use of milk from tuberculous cattle for food.

'It is without question most important to build sanatoria for the treatment and cure of early cases of tuberculosis; to form societies which spread information concerning the disease and its prevention to the sick and well alike; to build hospitals for hopeless and dying cases, in order to remove them from their homes at the period of greatest danger to those around them; to pass laws against promiscuous spitting; to regulate ventilation and over-crowding of tenements and factories; to encourage good living amongst the masses in every way possible. All of these things are useful and necessary, but we will still fail in doing our whole duty, if we neglect to guard against food products from tuberculous animals and to make every effort for the eradication of tuberculosis from cattle.'

'Maragliano has vaccinated a number of children against tuberculosis, the results constantly controlled by experiments on animals. The blood serum gradually acquired agglutinating power up to 1/100, the same as in the animals, and intravenous injection of the animals with virulent cultures of tubercle bacilli demonstrated that they were refractory, completely immune against tubercle infection. He thinks the probabilities are all in favour of the assumption that the children have been rendered similarly immune although confirmation of the test by inoculation is of course out of the question. He proceeds as for small-pox vaccination, and there is a slight febrile reaction the same as in the latter. By what he calls the "progressive" technique he commences with passive and goes on to active immunization. He first injects immunizing substances derived from the blood of immunized animals. This stage is followed by injections of these same substances plus substances derived from the bodies of killed bacilli, a material absolutely incapable of inducing infection. The third and final stage is the injection of products of the tubercle bacilli, also harmless. After a period of three to four months the serum has acquired antitoxic, antibacterial and agglutinating properties. The controls treated step by step in the same way acquire these same properties and prove completely immune to infection with virulent tubercle bacilli. The dead bodies of the bacilli are the chief factor in this vaccination, and the aim is to induce a focus of tubercular inflammation at the periphery entirely free from live tubercle bacilli. From this focus emanate the influences which induce the antitoxic, antibacterial and agglutinating properties, the reaction of defence on the part of the organism. This insures a true and special vaccination. He makes the injection in the arm as for small-pox vaccination. A small amicrobian abscess develops which is slow in healing, sometimes persisting for three or four months before completely healing. His experiences with animals have demonstrated beyond question, he believes, that it is possible to confer immunity by this simple technique. Maragliano adds that his research in this line preceded those of others by six years. Italy also took the lead in the administration of antitoxins by the mouth, as also in vaccinating man against tuberculosis. Elsewhere the question is still in the phase of mere hypothesis.'

Experiments on the disinfection of tubercular sputum.—This month's number of *Public Health*, the official organ of the Incorporated Society of Medical Officers of Health of England, says :—

'We have received Dr. Klein's report on the final results of a long series of experiments which were undertaken with a view to ascertain whether it was possibly to thoroughly disinfect the floors of public houses, &c., within the limited time available for this purpose, *i.e.*' from (say) 12 p.m. to 6 a.m. Any honest attempt to lessen the acknowledged evil arising from this source of infection must meet with the approval

of our readers, and we have therefore pleasure in commending Dr. Klein's report to the earnest attnention of all who are interested in public health; and in these days who are not ?

'It is unnecessary to dwell here upon the ease with which it is possible to demonstrate the presence of virulent tubercle bacilli in dust swept from the floors of public houses, railway carriages, etc.; this has been done by various reliable workers both in this country and abroad, as recently as January of the present year, when we took samples of the expectorated matter on the floor of a public bar in London (*v.* Public Health, p. 547, June, 1904), and submitted them to Professor Klein, who reported that he found typical tubercle bacilli in fifty per cent of the samples received!

'Realizing the gravity of this source of infection we then requested Prof. Klein to ascertain for us the best practicable method of destroying such tubercle bacilli as might be found on the floors of public houses, railway carriages, and other public places, by the use of a reliable disinfectant, and we have now the final result of the experiments he undertook to this end.

'In one sense, it is to be regretted that Dr. Klein's very satisfactory results were not obtained with a non-proprietary article. Yet a moment's reflection will suffice to show that in this, as in many other fields of research, it is to private enterprise we must look for any real progress in the future; for to what or whom else *can* we look ? Assuredly not the State !

'One feature of Dr. Klein's report appears to us to call for special comment; we refer to the manifest desire to place the question dealt with on a *practical* basis. Many investigators have shown satisfactory results with 24 hours' contact. Such results are interesting from an academic point of view, but how are they to help us when applied in actual practice? When and where is this period of time admissible? Certainly not in the problems which confront us in every-day life. Dr. Klein starts with the assumption that he has a certain limited period of time at his disposal—to wit, six hours—presumably from midnight to six o'clock on the following morning. In this we think he is well advised, for there are few situations calling for practical disinfection where provision cannot be made for this very essential condition. To run over the floor with a mop soaked in the disinfectant solution, and to "leave floor thus well moistened for a period of six hours," is at once simple and practicable, and we trust the suggestion will be widely adopted.

'Dr. Klein's report, the result of which we again commend to the attention of all who are engaged in the fight against tuberculosis, runs as follows :—

'On June 11, tubercular sputum dried on tile since June 9 was used in the following manner :—

'(*a.*) A small part of the dried sputum was injected subcutaneously into a control guinea-pig.

'(*b.*) The rest of the dried sputum was well soaked with cyllin (dilution 1 in 160)and left thus for six hours, after this it was washed and injected into two guinea-pigs—one intraperitoneal and the other subcutaneous—the amount in each case being the same, if not more than that used for the control. To-day (July 12), the control grinea-pig has big firm inguinal glands, and when killed shows internally numerous tubercles, with tubercular bacilli present in large numbers. The other medicated animals were killed and all found to be perfectly normal. From this it appears, then, that cyllin when diluted in the proportion of 1 in 160 acting on tubercular sputum for six hours at room temperature, is capable of completely disinfecting all *B tuberculosis*. For practical purposes, therefore, it would only be necessary when working with this disinfectant, to wash well with a mop the floor, presumably containing tubercle bacilli, using a dilution of 1 in 160, and to leave the floor thus well moistened for a period of six hours.

Congresses and meetings.—There has not been a meeting of the American Public Health Association within this quarantine year. The last meeting was at Washing-

ton, D.C., in October a year ago, and the next is to be held in Havana in January next.

The Canadian Medical Association held its annual meeting in Vancouver, B.C., August 23-27 last. A resolution calling for the establishment of a Dominion department of public health was again passed as I have already reported. Many important papers were submitted and discussed. The next meeting is to be held at Halifax, N.S.

Inspection duty.—Leaving Ottawa on July 8, I inspected the Leper Lazaretto at Tracadie, N.B., and the quarantines at Chatham and St. John, N.B.; at Halifax, Sydney, Louisbourg and Pictou, N.S.; Charlottetown, P.E.I., and Grosse Isle, Que., getting back to Ottawa on August 5. Leaving again on the 16th I attended the meeting of the Canadian Medical Association at Vancouver, B.C., and inspected our quarantine arrangements there and at Victoria and William Head, and on the return trip had interviews with the secretary of the Territorial Department of Health of the Northwest Territories at Regina, Assa., and with the secretary of the Provincial Board of Health of Manitoba at Winnipeg.

Trachoma from Japan.—As sanitary adviser of the Dominion government I was asked whilst in British Columbia by the Hon. Mr. McBride, Prime Minister of the province of British Columbia, to meet him, the acting superintendent of the Provincial Police, and the provincial health officer, with reference to questions relating to the Japanese immigration to that province. The officers of the United States Public Health Service stationed at Victoria and Vancouver refuse to give health certificates to enable Japanese destined for the United States to enter that territory so long as they have any symptom whatever of the disease in question. These people are consequently thrown back upon British Columbia for a temporary or, in incurable cases, a permanent, residence during which the disease may be communicated to others, and with the prospect that the incurable cases will become, from subsequent blindness, a burden upon the public funds. A report on the subject was submitted by me for the government upon my return from the coast.

National Park at Banff, Alta.—This park extends for 103 miles on the main line of the Canadian Pacific Railway, and in it are contained Canmore, Anthracite, Banff, Laggan and Field. Whilst passing through Banff, this summer, I took occasion as sanitary adviser of the government to make inquiries in relation to the appointment of a Dominion medical health officer for this National Park. The appointment of such an officer had been already recommended by Dr. James Patterson who has been acting for us in the Territories during the small-pox epidemic. Mr. Douglas, the park superintendent, with whom I had an interview, strongly urged the desirability of such an appointment, so that on the first suspicion of a case of infectious disease there might be some recognized medical officer upon whom he and others might call with an assurance that prompt and impartial action would be taken in the matter. A report on the subject was submitted by me for the government under date of the 10th ultimo.

The Quarantine Stations, &c., Grosse Isle, Que.— At this station and at its substation of Rimouski, 381 vessels have been inspected during the year, 352 at Grosse Isle and 29 at Rimouski. This shows a decrease as compared with last year, due in part to the late opening of navigation in the St. Lawrence this spring, and in part to the ever increasing size of modern vessels, one such sometimes replacing two or more of the older smaller ones, 70,111 persons were inspected.

Twenty-three vessels arrived with infections disease.

The admissions to hospital were 237. They included cases of small-pox, diphtheria, scarlet fever, measles, enteric fever and chicken-pox.

The deaths in hospital were three.

Provision has been made by you in this year's estimates for the early addition to this station of the much needed second steamer, and for the commencement of the extension of the wharf into deep water. The most pressing present requirements are a small steam disinfector for the hospital, and an administrative building in the 'Healthy' division, to contain consulting room and surgery below and some bedrooms and small wards above, for non-infectious cases that cannot well be sent to an infected hospital.

The question of rebuilding the old wooden detention sheds which date from 1832 and 1847, spoken of in my two last annual reports is becoming more and more deserving of your consideration as each year passes by.

Halifax, N.S.—Vessels inspected, 233; 46,715 persons were inspected.

Six vessels arrived with infectious disease.

One death occurred at the station, from broncho-pneumonia secondary to measles.

As I reported last year, the pressing wants of this station are the electric lighting of the station, and the erection of a winter hospital as is now being done for St. John, N.B.

St. John, N.B.—Vessels inspected, 204. Persons inspected, 20,596. Admissions to hospital, 37. Deaths, none. Persons vaccinated, 252.

Owing to the increasing growth and importance of this port additional detention buildings, and a suitable winter hospital are being erected, and an acetylene gas plant is being installed.

A deep water wharf continues to be the most pressing want of this station.

Sydney, C.B.—Vessels inspected, 69. No infectious disease has reached this port this year. The wharf being now built at the Point Edward quarantine station will be a valuable and much needed addition.

Louisbourg, C.B.—Vessels inspected since the inauguration of this station in January last, 17; persons inspected, 422. This station will now require at least the minimum equipment of wharf, disinfector, and hospital on approximately the same scale as those at Sydney.

Chatham, N.B.—Vessels inspected, 55. No infectious disease found during the year.

Charlottetown, P.E.I.—Vessels inspected, 48. No infectious disease found during the year.

In consequence of an outbreak of small-pox in Cape Breton, inspection of all vessels arriving from Pictou was carried out from April 7 to May 17 last. Some repairs were made to the hospital.

The road leading to the station passes for some distance along the water's edge. The shore front is being worn away by the action of the waves, and on the other side the road is reported to be gradually encroached upon by the moving out of the fences by the adjoining farmers. Between the two causes the road threatens to become impassible. The Department of Justice has been requested to look into the case for the Crown.

William Head, B.C.—Vessels inspected, 308. This is a smaller number than for some years past. This is due in part to the war in which Japan is engaged which has led to the fortnightly service of the Nippon Yusen Kaisha being discontinued as the vessels have had to go into the home transport service, and in part to the ever increasing size of modern vessels leading to the carrying of the same or even greater tonnage in fewer bottoms. Persons inspected: cabin passengers, 10,439; steerage passengers, 15,705; crews, 20,150; total, 46,294. Of the steerage passengers, 5,061 were

Chinese, and 2,745 were Japanese, other Asiatics numbering 417. Of the crews, 5,517 were Chinese, and 1,086 were Japanese.

On account of the prevalence of plague in the ports of departure the special examination (including temperature and glandular regions) has been continued throughout the year.

On three steamers cases of enteric fever were found, and three cases of beri-beri in the convalescent stage on a sailing vessel. Two suspicious cases were landed for observation and bacteriological examination and held until ascertained to be non-infectious.

A new and suitable steamer to replace the *Earl* is one of the most pressing needs of this station. Towards this you have already secured a partial preliminary appropriation.

Victoria, B.C.—Number of foreign coasting vessels touching this port, 847; number inspected, 4. No infectious disease.

Vancouver, B.C.—Vessels inspected, 7; no infectious disease.

Temporary Frontier and Coast Inspection.—In addition to these regular stations, you have this year given the country the additional protection of extra inspecting officers at the following points, where peculiar threatening of small-pox, or the reported lack of effective health organizations, to the south of them, seemed to make the importation of small-pox most to be feared: in Cape Breton, Louisbourg; in Nova Scotia, Yarmouth and Canso; in New Brunswick, McAdam Junction, Edmunston, Houlton (Debec Junction), and St. Stephen; in Ontario, Sault Ste. Marie, and Rainy River; in Manitoba, Sprague, Morden, Crystal City, Killarney, and Deloraine; in British Columbia, Northport (for Rossland and Nelson), Grand Forks, and Greenwood.

In addition, extra special inspections were temporarily made at Georgetown and Charlottetown, P.E.I., of vessels from Pictou on account of an outbreak of small-pox in Cape Breton; and at British Columbia ports of vessels from Alaska during a short outbreak of that same disease in Juneau and Ketchikan.

The North-west Territories.—Small-pox in the Territories this year has been of a more severe type than in last year. Of the cases reported the same note as that of last year is to be repeated, that none were Mennonites, Galicians, or Doukhobors.

Dr. James Patterson, your very efficient public health officer in the Territories, reports that during the last ten weeks he has not had a single new case reported and that he does not know of one case in the North-west Territories. He gives it as his opinion that the epidemic is at an end; for this season at least.

The Yukon Territory.—There have not been any cases of the major infectious diseases during this year in this Territory.

Leper Lazaretto, Tracadie, N.B.—There are now at this institution, 15 inmates, ten males and five females. One less than at this date last year. There have been four deaths during the twelve months and three new cases have been admitted. Four of the patients have lost their eyesight, one from repeated attacks of iritis, the others from leprous infiltration and ulceration.

As referred to above under the heading of Leprosy the use of Chaulmoogra oil has been found very beneficial.

One patient aged 41, who came into the Lazaretto in 1878, is so far cured that he can safely be, and is, allowed to be out on leave of absence, under observation.

Public Works Health Act.—Your inspector reports that at all the very many camps in the various public works throughout the Dominion, he has found the med-

ical supervision, and the hospital accommodation given, the medicines provided and the sleeping quarters for the men when housed together or in tents to be equal to, if not an improvement on, the very good conditions reported last year.

The year has been an exceptional one in the almost general absence of infectious disease amongst the men so employed.

Your inspector submits two suggestions that have been made to him by local medical officers. First: that none but vaccinated men shall be employed on the public works of the Dominion; and second: that contractors on such works shall be obliged to dig temporary wells where pure water cannot otherwise be obtained.

I have the honour to be, sir,

Your obedient servant,

F. MONTIZAMBERT, M.D.Ed., I.S.O., F.R.C.S.E., D.C.L.,

Director-General of Public Health.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 2.

(G. E. MARTINEAU, M.D.)

GROSSE ISLE, QUEBEC, October 31, 1904.

SIR,—I have the honour to submit this my annual report of the St. Lawrence quarantine service to October 31, 1904.

There were 352 vessels examined at this station during the year, being a decrease of 93 as compared with the year of 1903. This is due largely to the lateness of the opening of navigation, to a number of vessels clearing at Sydney and to the increased size of the vessels now in the St. Lawrence trade. Of the total number only 17 were sailing vessels.

The total number of persons inspected was 70,111, being a decrease of 4,125 as compared with last year.

These were divided into the different classes of passengers as follows: First cabin, 2,487; second cabin, 1082S; steerage, 32,272; cattlemen, 1,738; crew, 22,312; stowaways, 477.

The number of stowaways while not as large as during last season still continues very great and the class as a rule are not what would pass the inspection of the Immigration Department if they were examined.

Infectious disease was found or reported on the following vessels arriving at this station, named in the order of their arrival: ss. *Lake Manitoba, Parisian, Dominion, Salacia, Sardinian, Southwark, Sicilian, Tugela, Tunisian, Kensington, Lake Champlain, Mount Temple, Canada, Lake Erie, Vancouver, Montreal, Ionian, Corinthian, Monteagle, Halifax, Jeanara, Bavarian and Pomeranian.*

The diseases so discovered or reported were: small-pox, scarlet fever, measles, diphtheria, chicken-pox and typhoid fever.

Small-pox.—SS. *Salacia*, Captain Mitchell, sailed from Glasgow on April 15 with 9 cabin passengers, 27 cattlemen, 43 crew and 9 stowaways, arrived at the station on May 3 with one cattleman ill with small-pox since April 22.

That case was immediately removed to the small-pox hospital at quarantine.

The captain having anchored his steamer near the station the rest of passengers and crew were landed for quarantine of observation.

We began immediately the vaccination, the disinfection of baggage, clothes, bedding, &c.

The disinfection of the steamer with sulphur, formaldehyde and bichloride of mercury being completed, she proceeded on the way upon May 1 with a new crew in charge of her.

Two new cases of small-pox were developed among the crew on the following dates: one on the 11th and the other one on the 12th, these two cases were occupying on board the steamer the same cabin as the first case landed.

Nearly all the crew proceeded to sea with ss. *Salacia* brought down to the station by another crew on May 15, and the rest of passengers and crew having completed their period of eighteen days for observation were released on May 22.

All the cases of small-pox fully recovered, and they were discharged from the hospital at quarantine and left the station on May 22.

On two occasions passengers refused to permit themselves to be vaccinated, although on several other occasions parties who had refused vaccination by the ship's surgeon consented to allow the quarantine officer to do so.

The parties that refused vaccination arrived here on the ss. *Pretorian,* August 3, and on the ss. *Lake Champlain*, September 16.

They were landed for the usual period of observation.

The total number of admissions to the hospital was 237.

The deaths numbered three, two from broncho-pneumonia, complication of measles, and one from heart failure.

Quarantine Staff.—The Rimouski sub-station was this year in charge of Dr. E. Belisle, who made the inspection of the weekly mail steamers.

Requirements and improvements.—I have to note with pleasure the fact that necessary steps have been taken so as to provide this station with a suitable second steamer for the next season, and also that a certain amount has been granted for a deep water wharf. When these two above requirements will be completed, it will bring Grosse Isle into the foremost rank of quarantine stations of the first class.

The chief requirements now are a steam laundrying disinfecting apparatus for the hospital, so as to sterilize the contaminated linens, bedding, clothes, &c., and a new building to be erected in the upper division so as to have an office, a surgery, &c., in that part.

There are still some other works, repairs, &c., absolutely necessary, the list of which is in the hands of the Department of Public Works and of our department.

All of which is respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

G. E. MARTINEAU, M.D.,

Medical Superintendent, St. Lawrence Quarantine Service.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 3.

(N. E. MACKAY, M.D., M.R.C.S.)

HALIFAX, N.S., October 31, 1904.

SIR,—I have the honour to submit my annual report of this station for the year ended October 31, 1904.

The quarantine work here was uneventful during the year just closed, there being none of the graver forms of disease brought into port and only a few of the minor diseases.

We inspected during the year 233 vessels; 1,905 cabin passengers; 7,933 intermediate; 22,705 steerage; 361 cattlemen; and 13,810 crew; a total of 46,715 souls.

Minor quarantinable diseases were found on board the following vessels : ss.*Pretorian*, from Liverpool, December 28, 1903, a child sick with measles; ss. *Laurentian,* from Liverpool, January 5, 1904, one case of diphtheria; ss.*Pallanza,* from Hamburg, January 18, two cases of measles; ss. Ionian, from Liverpool, March 27, one case of measles; ss. *Dominion,* from Liverpool, March 28, two cases of measles, and the ss. *Canada,* from Liverpool, July 22, two cases of measles.

The patients ex ss.*Laurentian* and ex ss. *Pallanza* were treated in the Infectious Disease Hospital in the city. For three months from about January 1, 1904, the eastern passage was frozen over, from a little below George's Island to the big wharf at the station, consequently communication was stopped by this route for the period mentioned. For this reason we were obliged to treat the patients above named in the city infectious hospital. The only way we could get to the station during this period was by going outside the harbour and round MacNab's island, but our boat is entirely too small to go outside the harbour in winter weather. All the other patients were treated as usual at the station.

One death occurred at the station during the year—a patient ex ss. *Pallanza*—from broncho-pneumonia secondary to measles. The patient was in a moribund condition when the vessel arrived in port.

Two immigrants ex ss. *Bavarian* refused vaccination.

The following repairs and improvements were made during the year just closed:—

The hydrants were put in good repair. It is to be hoped they will now withstand our winter frost.

One third-class detention building was partitioned off into rooms for the better accommodation of immigrants.

The first-class building was reshingled as was also the sulphur dioxide house, and the roof of the hospital was repaired and two rooms in it were fixed up nicely for the reception of cabin passengers. The foundation of the store-house was rebuilt and the inside of it ceiled and half of it shelved.

Requirements. We need an electric plant at the station for lighting the buildings, and also a good new hospital with a capable steward and matron in charge of it who would keep it at all times in readiness for the reception of patients, as well as nurse the sick.

A new steamer is urgently required with better accommodation for the crew and immigrants. The boat should be large enough to go outside the harbour and round MacNab's island to the station in winter weather. Indeed I may state that it is not safe to approach a large liner in motion with the boat we have, even in day time and with smooth water.

I have again to report that inspecting vessels at night does not help the trade of the port in the least degree. We have been roused out of bed to board vessels in the stream after twelve at night on the plea that the owners wanted to begin at once to discharge perishable freight, such as fruits, &c., only to find these vessels were not even docked at eight o'clock the following morning. I would recommend that a regulation be made limiting inspecting hours to from sunrise to sunset.

I have the honour to be, sir,
Your obedient servant,

N. E. MACKAY, M.D., M.R.C.S.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 4.

(J. E. March, M.D.)

St. John, N.B., October 31, 1904.

Sir,—I have the honour to submit my report for the year ending October 31, 1904.

Although trade through this port is steadily increasing the average yearly increase for the past ten years being 68 per cent—there has been a large decrease during the past year in the number of vessels requiring quarantine inspection. This, I think, is accidental, and is due to the fact that, owing to the low rates prevailing for ocean tonnage, charterers have been able to find such vessels as they required largely within the district exempted from quarantine inspection —*i.e.*—at United States ports north of, and including New York.

I have inspected during the year 204 vessels ; 13,168 passengers ; 7,428 members of crews, and have vaccinated 252 persons.

Twenty-seven cases of measles, 7 of scarletina, 1 of diphtheria, 1 of erysipelas and 1 of pneumonia were treated in quarantine hospital. All recovered.

The masters of arriving vessels reported deaths on board during the voyages as follows : ss. *Lake Erie,* one death from heart failure, February 25 ; ss. *Lake Michigan,* one suicide, by drowning, March 18 ; ss. *Lake Erie,* one death from spasm of the glottis, April 9.

The ss. Lake Manitoba reported one birth four days before arrival. From the mother, who was developing symptoms of septicaemia, I removed a partially adherent and wholly retained placenta. This case was sent to the General Public Hospital and recovered.

During the year contracts have been given out for the erection at this station of a winter hospital for forty beds, two detention buildings for steerage passengers, to accommodate 250 persons each; and a small brick building to contain an acetylene gas generator and gasometer. These buildings are now being erected. The hospital and gas-works will probably be ready by the beginning of the new year. The other buildings can hardly be ready before March, 1905. When they are completed we shall have comfortable accommodation for 1,200 persons.

Under an agreement made a year ago between the Department of Public Works of Canada and the city of St. John, the latter laid a water main through and to the

foot of St. John street and around the southeastern angle of Fort Dufferin on the mainland to high water mark. This was completed early in September. At this point, under Fort Dufferin, the Department of Public Works was to make its connection, lay the pipe across the west channel 3,800 feet to Partridge Island and put down the mains on the station to the several buildings. As yet nothing has been done in this direction.

It is impossible for me to put too much stress upon the importance of completing this waterworks system. Without it any moment may demonstrate that all the money expended here in the erection of buildings and in providing equipment for the eradication of quarantinable disease has been wasted. I respectfully ask again that the work be proceeded with even in the face of approaching winter.

At the request of the Director-General of Public Health the Department of Public Works sent the dredge *New Dominion* to the station in September for the purpose of deepening the approach to the wharf. As you are aware we are not provided with such a wharf as we should have for quarantine purposes. Until the dredging was done not even a row-boat could get within one hundred feet of the wharf at low water. Now, however, as a result of the dredging, and, when a small low water landing, which the Department of Public Works has undertaken to construct at once, is completed, it will be possible to bring a small boat, barge or vessel drawing not more than three-and-a-half feet of water, to either the 'landing' or 'wharf' at any time of tide. This will be a great advantage to us as it will permit of landing the sick without transferring them from boat to boat and, eventually, out upon the beach as has been hitherto, at times, unfortunately necessary. I have already expressed my thanks to the officers of the Public Works Department who so promptly and satisfactorily made this improvement.

The question has arisen between the local Canadian inspector of immigration, and also the United States immigration officers stationed here during the winter months, and myself, as to whether it is my duty to take back into quarantine persons who have been inspected and passed by me, and who, later, while being detained in the immigration sheds at Sand Point, develop contagious disease. I have been unable to find anything in the Act which would justify me in meeting the wishes of these officers in this particular.

I make my inspections carefully; see for myself each and every passenger; remove all cases of quarantinable disease, together with all known contacts and suspects—I refer now, of course, to the minor quarantinable diseases—and, after the completion of such disinfection as may be necessary or even during its progress—having taken every reasonable precaution to protect the public health—I issue *pratique*. If two or three days or a week later, a case of measles or scarletina or diphtheria develops among these people while detained in the immigration sheds, it is not one which, under our regulations, can be transferred to the maritime quarantine station merely because the officer of the department responsible for the detention—sometimes an officer of a foreign country—thinks that the quarantine station is the best place and the quarantine officer the best man to care for the case. The acceptance of such a case, in such a way by the quarantine officer, is, prima facie, an admission that he has not properly performed his duties in the first instance. Fortunately the regulations do not require him to so stultify himself. Were, however—and it is this which has prompted me to refer to the matter—were the control of the public health in Canada consolidated under one department, such cases as I have cited might properly and without prejudice be sent at once to the nearest hospital under public health control. At St. John, that would be to the quarantine station. This would at once relieve the immigration officers, whether Canadian or foreign, having these persons in charge, and also the steamship company which is now ultimately compelled to pay for their removal and care, and, at the same time it would afford that promptness in removal and thoroughness in disinfection, and that care in treatment, which the people for economic reasons, and the patient for humanitarian ones should receive . Unfortun-

ately, so far as our practice is concerned, the idea seems to be advanced that in public health a divided control is better than a sole control, and that a multitude of officers operating under different jurisdictions, having quite different objects in view, and necessarily employing different methods, is superior to a compact, disciplined and united corps. This is not, and cannot be, true.

During the year ending to-day, 708 deaths occurred in the city of St. John. Of these, 128 were due to tuberculosis and of the 128 eleven were imported. In the United States they have scheduled tuberculosis as a quarantinable disease and require the disinfection of quarters occupied by consumptives before others are permitted to live in them. I still look forward to the time when this shall become the practice in Canada.

I desire to express my sincere thanks to the officers of your department for official and social courtesies extended to me during a brief visit to Ottawa in August.

I have the honour to be, sir,
Your obedient servant,
J. E. MARCH, M.D.
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 5.

(H. RINDRESS, M.D.)

NORTH SYDNEY, October 31, 1904.

SIR,—I have the honour to submit my report for the year ended October 31, 1904.

The total number of ships inspected for the year ended is 69—53 steamships and 16 sailing vessels.

A fewer number of ships have been inspected at this port this year than any previous year since my appointment.

I am glad to say that no quarantinable disease has reached here from any foreign port during the year.

The wharf which is now being built at Point Edward will be a valuable and much needed addition to the station there.

The buildings are in good repair.

I have the honour to be, sir,
Your obedient servant,
HORACE RINDRESS, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 6.

(F. O'NEIL, M.D.)

LOUISBURG, October 31, 1904.

SIR,—I have the honour to submit herewith my annual report for the quarantine year ending October 31, 1904.

I am pleased to say that there has been no case or cases of infectious or contagious disease.

I have examined (since January 7, 1904, the date of the establishment of this station) 17 vessels with a total number of 422 men.

I would beg leave to suggest that some provision be made to take care of any case or cases of contagious or infectious disease which might occur at any time.

I have the honour to be, sir,

Your obedient servant,

FREEMAN O'NEIL, M.D.,

Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 7.

(P. CONROY, M.D.)

CHARLOTTETOWN, P.E.I., October 31, 1904.

SIR,—I have the honour to submit my report for the year ending October 31, 1904.

No quarantinable disease was brought to this port during the past year.

Foreign vessels arriving here usually touch at some Canadian or other northern port which, under present regulations, is temporarily exempted from inspection.

By reason of the prevalence of small-pox at Sydney, Cape Breton, inspection of all vessels arriving from Pictou during the continuance of the epidemic, was deemed necessary, and was carried out under instructions from the department. This inspection began on April 7, and was continued till May 17.

There were in all 48 inspections at this station during the past quarantine year.

The hospital building has been thoroughly repaired, but repairs are still needed to the outbuildings with increased accommodation for storing, washing and disinfecting.

The roadway to the hospital along the shore front is much worn away by the action of the sea, and is also being gradually encroached upon by the continual mov-

ing out of the adjoining fences. The road should be surveyed and made safely passable.

All of which is respectfully submitted.

I have the honour to be, sir,

Your obedient servant,

PETER CONROY, M.D.,

Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 8.

(J. MACDONALD, M.D.)

CHATHAM, N.B., October 31, 1904.

SIR,—I have the honour to submit my report for the year ending October 31, 1904.

The total number of vessels inspected at this port for the year just ended is fifty-five. The number is below the average, which is due to the fact that quite a number of our ships had to enter the ports of Louisbourg and Sydney early last spring on account of encountering heavy ice in the gulf.

The caretaker's residence and hospital buildings are in good condition. An outlay of about $25 or $30 has been incurred for a boathouse, which was required to keep our boat from the sun and weather during the winter months.

The accounts for lumber, labour, etc., have not yet been handed in.

I am pleased to state that no disease of an infectious character was found on any of the vessels inspected at this port.

I have the honour to be, sir,

Your obedient servant,

J. MACDONALD, M.D.,

Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 9.

(A. T. WATT, M.D.)

VICTORIA, B.C., October 31, 1904.

SIR,—I have the honour to submit this my report on the William Head quarantine station for the year ending October 31, 1904.

During the twelve months 308 vessels were inspected. This is a smaller number than has been inspected for some years past. The falling off has been owing in part

t the war between Japan and Russia, as on this account the fortnightly service of the Nippon Yusen Kaisha was discontinued, the steamers going into the transport service when hostilities commenced. The sale, last winter, of the fleet of steamers belonging to the Northern Pacific Company was another factor in the decrease. These steamers were sold to a coasting company and ceased calling here after March last. Before the advent of the *Empress* liners, the steamers of this fleet were operated by the Canadian Pacific Railway Steamship Company, and were therefore the first in the trans-Pacific trade to Canada. The steamers which are now to take their place have not yet reached here, although one of them, the *Minnesota,* is now on the way. This steamer is one of the largest freighters afloat, and will carry more than double the cargo formerly carried by the whole fleet she is displacing.

It may be said of all the steamers now in the trans-Pacific trade that they are large, modern vessels; and that being so, it can be understood that the quarantining and disinfecting of these large vessels is a proportionately greater undertaking, and that time-saving arrangements and a complete equipment are necessary to a station dealing with such vessels. It is, therefore, a matter for congratulation that liberal appropriations have been made for William Head station, with which many much needed improvements have recently been carried out or are under way.

In regard to the number of passengers and crew inspected, the figures for them are : Cabin passengers, 10,439; steerage passengers, 15,705 (including stowaways) : and of this number 5,061 were Chinese and 2,745 were Japanese, while other Asiatics numbered 417. The balance of steerage passengers were for the most part Europeans coming by boat from San Francisco. The members of crews numbered 20,150, and of these 5,517 were Chinese and 1,086 were Japanese. The routine disinfection of all steerage passengers from China and Japan and of the Asiatic members of crews has been carried out at the ports of embarkation, as was the case the previous year. On arrival here a special examination comprising inspection of glandular regions was made in the case of all Asiatics, this being done in consequence of the presence of plague in several of the ports of the Orient. There has, however, been a very great improvement in the health conditions of the various ports during the past season. The number of cases of plague in Hong Kong has been less than one-fourth of the average of several previous years. The number of cases which occurred last season was about 300. The cases of small-pox reported were few from all ports. No case of plague occurred on any steamer bound for here, and only on one steamer from China, the C.P.R. ss. *Athenian* did small-pox break out. Small-pox, however, developed amongst a number of pilgrims being carried from Jedah to Singapore by the Ocean Steamship Company's steamer *Calcas*.. There were two cases, of which one ended fatally. The steamer underwent quarantine at Singapore, and had no further cases on board.

No cases of infectious disease were treated in the hospital here during the year. Two suspicious cases were landed for observation and bacteriological examination and held for some hours until ascertained to be non-contagious. On three steamers typhoid fever was found, but as the cases were being properly handled and cared for on board, they were not brought on shore for treatment. Three cases of beri-beri in convalescent stage were found on a sailing vessel from Manila, and a death occurring during the voyage was also attributable to this complaint.

During the year three steamers were disinfected at the request of the Provincial Board of Health. These were the coasting steamers, *Tees* and *Nell,* each of which landed a case of small-pox at Port Simpson, and the C.P.R. ss. *Athenian*, owing to the discovery that a second cabin passenger, who had gone ashore at Vancouver, died from black small-pox. The diagnosis was made shortly before the man's death, and some hours after he had been in the hospital where he had been sent to recover from the effects of heavy drinking. The disease was of a malignant fulminating type, and death took place before the usual rash manifested itself. Dr. Anderson, assistant medical officer, who passed the vessel at quarantine, reports that he got a statement

from the ship's officers of a case of small-pox having been landed in Kobe, the steamer being held there for disinfection in consequence. This was 18 days previous to arrival of *Athenian* here. In consideration of the disinfection as done by the Japanese authorities, and the period which had elapsed and the fact that all seemed well on inspection here, he gave *pratique*. The passenger in question was inspected with the others, and although he was slightly ailing at the time, this appeared to be from the effects of liquor. The ship's surgeon stated that he had had him under treatment for some days on that account, and because of constitutional disease. The case created considerable comment, but too much is usually expected from quarantine, and as against small-pox this can not be made entirely effective without too great an interference with travel and commerce. Another instance of how small-pox may pass through quarantine occurred with the ss. *Senator,* from San Francisco, on which a mild case of the disease escaped detection and was discovered accidentally later in Seattle when the man was undergoing hospital treatment for an entirely different complaint. This man, one of the firemen, had been on duty all the time and had not paid any attention to the slight rash afterwards found on him. This rash had been out some days from appearance of same, but was very sparse, and the hospital surgeon wrote that he could easily understand how so mild a case could escape detection in the examination which can ordinarily be given at quarantine, especially at night, as was the case when this vessel was passed.

For some weeks during the past summer vessels clearing from Alaska were given special inspection owing to an outbreak of small-pox reported from there. Beyond the first few cases, however, there was no further spread, and the inspection was discontinued. No inspection has been necessary against the neighbouring states, as the cases of small-pox which were occurring there were few in number, and the menace was not sufficient to warrant the examination of persons entering British Columbia at boundary points, as had previously been the case.

Among the improvements during the year were the straightening of the approach to disinfecting building and the connecting of this building back with the main wharf so that the track for baggage cars could be carried, as it were, in a circle. This will greatly expedite the handling of baggage and clothes to be disinfected, and will prevent the possibility of those persons who have been through the bath mingling with those who have not. Another great improvement has been the filling in of an embankment along the shore and making a good road from the disinfection building over this to connect with the other roads in the grounds. Baggage and bedding which have been disinfected can now be taken in a cart to the various buildings. This formerly had to be carried on men's backs and was the cause of great complaint. The road connecting the station with the provincial government road has been greatly improved and gravelled throughout its length. The water main has been partly renewed. A good deal of repair work has been done to the wharf, fender piles, &c., renewed. The foundations of the main hospital, steerage and saloon buildings have been repaired and covered with cement. The roof of the main hospital has been reshingled. Alterations in plumbing to prevent freezing were made at the main hospital. Some painting and some fencing were also done. A small storage battery was put in and the range lights indicating the quarantine anchorage are supplied from it after the hour when the electric plant shuts down. This battery is not very large, but it runs a few extra lights where they are most needed. It can be seen that it would be of great advantage if the capacity were increased by another set of cells. A cottage being built for the electrician is nearing completion and the lumber is on the grounds for a house for the guards. Authority has just been obtained for more furnishings, bunks, &c., for various buildings and also for several other needed improvements. These are not mentioned in detail as they cannot be carried out until the next quarantine year. It must be mentioned, however, that an appropriation has been made for a new boarding and supply steamer for William Head station. This has been greatly needed and it is to be hoped it will soon be gone on with.

The station was visited during the year by the Hon. the Minister of Marine and Fisheries, Mr. Préfontaine, the Director-General of Public Health, Dr. Montizambert, members of the Dominion Medical Association, and by Dr. Cumming, Passed-Assistant Surgeon, Public Health and Marine Hospital Service, who is the quarantine officer at San Francsico. These and other visitors during the year expressed pleasure at the appearance of the station.

The bacteriological report of my assistant is appended hereto.

I have the honour to be, sir,

Your obedient servant,

A. T. WATT, M.D.,

Supt. B.C. Quarantines.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 10.

(W. H. K. ANDERSON, B.A., M.B.)

VICTORIA, B.C., October 31, 1904.

SIR,—I have the honour to submit the following annual report of the laboratory work at William Head for the quarantine year 1903-4.

Two cases arrived during the year necessitating a bacteriological diagnosis—one a Japanese steerage passenger with an enlarged inguinal gland and one a passenger from San Francisco with a malarial history. Both cases proved to be non-quarantinable.

Tests which were made of two formaldehyde fumigators proved their efficacy.

Much new apparatus has been installed and various germs have been studied and kept alive in subcultures as a routine.

I have the honour to be, sir,

Your obedient servant,

HAROLD ANDERSON, B.A., M.B.

Medical Assistant.

The Superintendent of B. C. Quarantines,
Victoria, B.C.

No. 11.

(R. L. FRASER, M.D.)

VICTORIA, B.C., October 31, 1904.

SIR,—I beg to submit my report for the year just ended.

Number of foreign coasting vessels touching Victoria	847
Number inspected	4

No contagious or quarantinable disease was found on any vessel inspected.

During the year all coasting vessels touching here were exempt from inspection, except from June 20 to July 22, when owing to small-pox at Ketchikan, Alaska, vessels from there were ordered to be inspected.

I have the honour to be, sir,
Your obedient servant,
R. L. FRASER, M.D.,
Quarantine Officer.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 12.

(L. N. MacKechnie, M.D.)

Vancouver, B.C., October 31, 1904.

Sir,—I have the honour to submit this my report for the year just ended. The number of vessels inspected was seven. No case of infectious or contagious disease came under my inspection during the year.

The steamer *Athenian* inspected at William Head arrived here May 25th carrying a passenger who died that day of what was first thought to be measles, and afterwards small-pox. The steamer was returned by the province to William Head for disinfection.

I have the honour to be, sir,
Your obedient servant,
L. N. MACKECHNIE, M.D.,
Quarantine Officer, Vancouver.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 13.

(J. Patterson, M.D.)

Winnipeg, November 1, 1904.

Sir,—My monthly reports gave you the details of the various outbreaks of smallpox in the North-west Territories during the past year. This my annual report will therefore merely be a short summary.

During the past twelve months the cases occurring at various points in the Territories were : Indian Head, 2; Regina, 6; Verna, 3; Battleford, 7; Jack Fish Lake, 8; Wolsley, 3; Macleod, 1; Evarts, 1; Floating Stone, 8; Onion Lake, 4; Calgary, 38; Wetaskawin, 3; Rosenroll, 5; Edmonton, 11; Stony Plain, 4; Spruce Grove, 1; Empeys, 2; Carstairs, 3; Cayley, 4; Medicine Hat, 6; Tregarva, 5; Banff, 10; Langdon, 4; Swift Current, 2; Okotoks, 1, making a total of 149 cases.

Of these 149 cases only 6 were half-breeds, none were Mennonites, Galicians or Doukhobors.

The type of the disease has been very much more severe than in former years. There was one death at Edmonton, two at Stony Plain, one at Rosenroll, one at Wetaskawin and three at Calgary. These died of confluent or hemorrhagic small-pox. The non-fatal cases were nearly all severe discrete or semi-confluent.

The disease was introduced to the Edmonton district by an immigrant from Glasgow and to Calgary by one from near Bay City, Michigan. At the last two places to which I was called, the outbreaks were clearly chicken-pox. Only children were affected; there was an entire absence of all the initial symptoms and the recently successfully vaccinated had as copious eruptions as the unvaccinated.

During the last ten weeks I have not had a single new case reported and to-day I do not know of one case in the North-west Territories. It appears to me that the epidemic is at an end; for this season at least.

I have the honour to be, sir,
Your obedient servant,
JAMES PATTERSON.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 14.

(A. C. Smith, M.A., M.D., C.M.)

Tracadie, N.B., October 31, 1904.

Sir,—I have the honour to submit my annual report as physician, &c., to the Tracadie Lazaretto.

The register of the institution shows the names of fifteen inmates—ten males and five females. One of these, a man aged 41, has been for some time out on leave of absence. His case appears to be one of those rare ones in which leprosy undergoes spontaneous cure—the malady having run its course the effects alone remaining. I hold him under occasional observation.

There are several stages of the disease, which are, however, often ill-defined. Classifying the lepers in the Lazaretto we may represent the number in the first stage to be six; in the second, seven; and in the third, one. The youngest patient is 10 and the oldest 62 years of age. There were four deaths during the past twelve months; and three new cases were admitted—one from without the province. Of those on our register nine are of French, three of Icelandic, and three of English origin. Four of our lepers have lost their sight, one from repeated attacks of iritis, the others from ulcerations and leprous infiltration. Whenever practicable the patients are given light employment in and around the buildings. Some of the men go boat-sailing in the harbour.

During the year chaulmoogra oil, in combination, has been freely used by the inmates and with very beneficial effects. Even in some advanced cases the effects of the oil are very marked, the patients becoming vigorous and expressing themselves as 'feeling better and much stronger.' At each periodical examination I find tubercles, and the blotches so characteristic of leprosy, disappearing. Erysipelas, and leproic fever, both accompaniments of the disease, and a source of much distress to our

inmates in the past, are almost unknown since the introduction of the oil two years ago.

During a recent tour of investigation through adjoining parishes I found one undoubted case of leprosy. This person has not yet been admitted. I also found three persons showing suspicious premonitory symptoms. Notwithstanding this I have again to report that leprosy is rapidly decreasing here. The absolute number has become much reduced within the past few years, and the reduction in ratio to the population is still much greater.

For several years past, under an instruction from the Director-General of Public Health, I have been compiling a record from all available sources of the history of our lepers from the first known cases; the local conditions connected with them; their origin, nativity, &c. As a result of careful investigation I become more and more convinced of the communicability of leprosy through contagion. I would cite one case from these records. A young woman whose father was leprous, and who herself developed the disease after marriage, had for some time in her employ a servant girl. This girl married a young man who like herself was free from any family taint of leprosy. After her marriage she became leprous and, with her husband, went to live in the same house with her husband's brother and his family. One of this brother's children afterwards became a leper, and four more of the children subsequently became affected and died in the Lazaretto. Had the disease been as promptly segregated then as is being done to-day, the parents would have been spared the distress of seeing five of their offspring leaving them, one by one, to die of a loathsome malady, away from their house.

I had hoped to add to this report some photographs illustrative of leprosy in its different stages, and more especially of those under special treatment with chaulmoogra oil, but I have not yet been able to overcome the aversion our inmates have to being photographed.

The State of Louisiana has recently erected a lazaretto for lepers, and an expert of the United States Public Health and Marine Hospital Service has pronounced it 'the equal of any hospital for lepers in the world, and superior to all in equipment and the method of treatment, except that of Tracadie, province of New Brunswick, Canada.'

I have the honour to be, sir,
Your obedient servant,
A. C. SMITH, M.A., M.D., C.M.

The Honourable
The Minister of Agriculture,
Ottawa.

No. 15.

(CHARLES A. L. FISHER, J.P.)

October 31, 1904.

SIR,—I have the honour to submit this, my annual report as Public Works (Health) Inspector, to October 31, 1904.

Since my last report I have again covered the Dominion from the Pacific to the Atlantic oceans, and have personally inspected all public works coming under the application of the regulations in force under the Public Works (Health) Act, 1899, which have in any way been brought to my notice.

The year has again been an exceptional one in the almost general non-appearance of contagious and infectious disease among the men employed on the various public works coming under my inspection, there being only four cases of small-pox in one of the railway camps, three developing in men having lately come from the United States, two cases of diphtheria in two camps, and about fifty cases of typhoid fever distributed over the very many camps in the various public works throughout the Dominion, these developing mainly where impure water had to be used.

I am pleased to be able to again report that at the said works inspected, I found the medical supervision given thereon, the hospital accommodation and medicines provided, and the sleeping quarters for the men when housed together or in tents to be equal to, if not an improvement on the very good conditions reported last year.

The following is a detailed report of the public works which I have visited and inspected during the past year, as coming under the regulations of the Public Works (Health) Act, 1899 :—

RAILWAYS.

The number of public works of this class have not been as numerous as during the previous year, but the capacity of the most important ones has been very greatly increased and the construction camps so extended, that a largely increased average has been added to the railway mileage of Canada, and a greater tract of fine farming land opened out for settlement.

Canadian Pacific Railway.—This company has had under construction in the past twelve months, seven branches, extensions, grade reductions, and diversions in the provinces of Ontario, Manitoba, the North-west Territories and British Columbia, as against twelve in the previous year.

Having visited all of said works in my official capacity, I am pleased to report that at such visits I found excellent hospital accommodation provided, the men comfortably housed in buildings or tents, and well fed, the camps in good sanitary condition, and a duly qualified physician as medical supervisor over each section of camps.

With one exception there has been no outbreak of contagious disease, and the health of the men has been generally good.

I give below the extent and location of these seven various works.

Sudbury-Toronto Branch (Sudbury, Ont. to Byng Inlet, Ont., 60 miles.)—The contractors for this work are Messrs. Foley Bros., Larson and Company, with head offices at Wahnapitae, near Sudbury.

About 1,500 men were employed, who were distributed over eighteen or twenty camps, and were boarded and housed in tents by the contractors.

Up to the time of my inspection, the general health of the men had been good, and there had been no outbreak of contagious or infectious diseases.

I found the camps well situated, and in good sanitary condition.

A very good hospital is established by the contractors at Romford, about five miles from their headquarters, and hospital tents are on hand at the various camps in case of necessity.

F. J. Ewing, M.D., the chief medical officer of all the Canadian Pacific Railway Company's construction works in Ontario and the North-west, has made his headquarters with the contractors at Wahnapitae, and is the medical supervisor of the works, with one or more assistants.

Fort William, Ignace and Rat Portage sections—(reduction of grades Fort William to Winnipeg, Man.)—The contractors for this work are Messrs. Foley Bros., Larson & Company, with head-quarters at Rat-Portage, Ont.

There were over 1,000 men employed on this work, who were distributed over twelve camps, and boarded and lodged in tents, by the contractors.

There had been very little sickness of any kind, and the health of the men was generally good.

Tents were provided for isolation purposes, and the permanent hospital used was at Rat Portage, Ont.

The medical officers over the works were Drs. Scovill and Gunne.

Arcola—Regina Extension—(113 miles).—This work was under contract to Messrs. Foley Bros., Larson & Company, with head-quarters at Regina, Assa.

The number of men employed was between three and four hundred, who were lodged in tents and supplied with the best of food by the contractors, there being four camps.

The health of the men was exceptionally good, there being no cases of contagious or infectious diseases.

Excellent permanent hospital acommodation was at hand at Regina.

J. A. Kane, M.D., was the resident medical officer in charge of the employees.

Moosejaw—Swift Current Section—(Grade reductions).—This work was under contract to Messrs. Foley Bros., Larson & Company, with head-quarters at Morse, N.W.T.

About four hundred men were employed thereon at the time of my inspection, who were distributed over eight camps, but a large increase was to be made thereto, very shortly after, to complete the season's work.

The health of the men was excellent, no serious sickness having occurred among them.

There were a number of camps distributed along the section, at which the men where housed in tents, and boarded by the contractors, with the best of food well served.

A very comfortable hospital, with a permanent attendant, was established at Morse, and the sanitary condition of the various camps was well looked after.

A. E. Finley, M.D., was the medical supervisor of the camps, with head-quarters at Morse.

Wetaskiwin-Lacombe Extensions—(Twenty-five miles each extension).—Messrs. Foley Bros., Larson & Company, contractors.

Between 600 and 800 men were employed on these works, distributed among seventeen camps, housed in tents, and boarded on the best food by the contractors.

Four cases of small-pox developed in one of the camps on this work, three of these evidently imported from the United States, the fourth contracted in the camp by a man who was not vaccinated, and who died. Every precaution as to quarantine. &c., was carried out. The health of the men was generally good, and the sanitary condition of the camps fairly well attended to.

The permanent hospital at Calgary was used when necessary, and good hospital accommodation was provided at Wetaskiwin, and spare tents at the various camps.

H. Y. Baldwin, M.D., with head-quarters at Wetaskiwin, was medical supervisor of these works.

Clanwilliam diversion.—(Mr. J. W. Stewart, contractor).—About 85 to 100 men employed, who were housed in tents and boarded by the contractors. The camps were in good sanitary condition, there had been no cases of contagious or infectious disease, and the health of the men had been generally good.

Permanent hospital accommodation was provided at Revelstoke, B.C., on the line of work.

J. W. Cross, M.D. of Revelstoke, was the medical supervisor of the work, but no report has come to hand from him.

Pheasant Hills Extension—(This is a continuation of the branch mentioned in my last report as from Neudorf to Jumping Deer Creek, being an extension thereof).—Messers. Foley Bros., Larson & Company, were the contractors for the grading, &c., the tracklaying being done by men employed by, and under the direct supervision of, the Canadian Pacific Railway Company.

About 400 men were employed in all, and distributed over the various camps, which were kept in a good sanitary condition, the men being housed in tents, and supplied with good wholesome food by the contractors and the Canadian Pacific Railway Company.

There had been no outbreak of contagious or infectious disease, and the health of the men had been generally good.

Permanent hospital accommodation was provided at Moosomin, Assa., and temporary hospital tents on the branch.

A. T. Condell, M.D., of Elkhorn, Man., was in charge as medical supervisor, assisted by Dr. Black.

CANADIAN NORTHERN RAILWAY.

This company has had under construction during the past twelve months, eleven extensions to their lines in Manitoba and the North-west Territories, as against fourteen in the previous year.

Having visited and inspected each of the said works, I may say that I there found the regulations under the Public Works (Health) Act, 1899, being fairly well carried out, the hospital accommodation being fully up to requirements, the men supplied with the very best of food, and comfortably housed, mostly in tents, the sleeping and dining quarters, and the various camps (with one exception) being kept in very good sanitary condition, and each of the works having medical supervision by a duly qualified medical officer, each of whom was under the charge of R. MacKenzie, M.D., and C. A. MacKenzie, M.D., of Winnipeg, they being the chief medical officers of all construction work of the Canadian Northern Railway Company, and these gentlemen gave me every possible assistance towards my making the necessary inspections.

With the exception of a few cases of typhoid fever in some of the camps, there were no contagious or infectious diseases, and the general health and condition of the men were excellent.

Grandview Extension—(From mileage 300 (White Sand River) to Lloydminster and Edmonton, Alta.). This is intended to be the main line of the Canadian Northern Railway Company, and the capacity of the staff and various gangs of men have been so largely increased since my last report, that through trains are likely to be running over it into Edmonton, by the latter part of next summer.

The contractors for the grading thereof are Messrs. J. D. McArthur & Company, of Winnipeg, and for the tracklaying, Messrs. Robinson & Company.

The work is divided into several sections, each of which is being carried on by sub-contractors.

About 1,800 to 2,000 men in all were employed on the work, distributed throughout the several sections and the various camps thereof, comfortably housed in tents or lodging cars, and all well supplied with first class food by the contractors.

There had been no outbreak of small-pox in any of the camps, and with some exceptions, where there had been two deaths from typhoid fever (undoubtedly contracted from the water used) there had been no contagious or infectious diseases, and the general health of the men had been excellent.

Good temporary hospital accommodation was supplied for each section, and hospital tents on hand in case of necessity.

Five duly qualified physicians had medical supervision of the various sections at the time of my visit, viz. : Doctors Crosby, Wray, Lee, Mitchell and Snyder, since when D. B. Neely, M.D., has been added to the medical staff.

Erwood Division—(Ballasting line and tracklaying from about 40 miles northwest of Erwood to Melfort).—The tracklaying was being done by Messrs. MacKenzie and Mann, the grading work was under contract to Mr. Neil Keith. About two hundred men were employed thereon, being housed in tents and lodging cars, and supplied with good substantial food by the contractors, and the camps and cars were kept in fairly good sanitary condition. There was no outbreak of contagious disease, and the health of the men had been generally good.

An excellent building was provided at Erwood, and well fitted out for hospital purposes, and tents were on hand at the various camps in case of necessity.

W. H. Scott, M.D., was in charge as medical supervisor up to about the time of my visit, and was then replaced by R. M. Oatway, M.D.

Melfort Extension—(Grading from Melfort to Prince Albert, Sask.)—This work was also under contract to Mr. Neil Keith; the number of men employed was about 250, and the conditions given for the former section apply hereto, with the exception that there were a couple of cases of typhoid fever in the camps.

Dr. Oatway was in charge of this and the above section, as medical supervisor of both, but no report has reached me from him.

Carberry—Brandon Branch—(Grading, &c.)—Contractors, Messrs. Cowan, MacKenzie and A. R. Mann. From 100 to 200 men were employed on this work, housed in tents, and well boarded by the contractors. There had been no outbreak of contagious or infectious disease, with the exception of one case of typhoid fever, and the health of the men had been of the best.

Permanent hospital accommodation was provided for at Brandon, and tents were ready at the camps in case of necessity.

The Sanitary conditions were fairly well attended to.

Dr. Hazard, of Sidney, Man., was the medical supervisor of the work, but no report has come to hand from him.

Hartney Branch.—Two to three hundred men were employed thereon, who were housed in tents, and well boarded. No contagious or infectious diseases developed, and the general health of the men was good.

Doctors Edmison of Dunrea and Bigelow of Hartney were the medical supervisors, but no report has been received from them.

Portage la Prairie Branch.—A small body of men were employed for a short time finishing up the work of the previous year, and were well housed and boarded, and kept in the best of health under the medical supervision of Dr. Hazard of Sidney, Man.

Grunway Extension—(From Grunway to Wakopa, about 45 miles.)—This work was under contract to Mr. A. R. Mann, and was about completed at the time of my visit. About 150 men were employed thereon, and there had been several cases of typhoid fever, but the general health of the men had been good.

Dr. Edmison of Dunrea, Man., was the medical supervisor of the work, but no report has been received from him.

Hudson's Bay Branch—(Winnipeg to Oak Point.)—Messrs. MacKenzie, Mann & Co. were the contractors for this branch. About 100 men were employed in surfacing for a short time, who were all well looked after by the contractors.

There was one case of typhoid fever, which was sent to the St. Boniface hospital.

Messrs. MacKenzie & MacKenzie, M.D.'s had the personal supervision of the men on this work.

Springfield Branch—(Winnipeg to Birds Hill).—Only a very few men were employed here, all having good health, and being under the medical supervision of Doctors MacKenzie, of Winnipeg.

Swan River Branch—(Grading from Swan River to Thunder Hill, Man.).—This work was under contract to Messrs. Kennedy & Co.

Only a small number of men were employed, who were well housed and boarded by the contractors, and there had been no outbreak of serious disease among them.

G. Bruce, M.D., of Swan River, had medical supervision over the men, but their health and condition was so good, that he probably has not thought it necessary to send me a report.

Carman—Somerset Extension—(Grading from end of Carman Branch, to Somerset.)—This work was under contract to Mr. Strevel.

About two hundred men were employed thereon, who were comfortably lodged in tents, and well boarded by the contractor.

No outbreak of contagious or infectious disease had occurred at the time of my visit, and the men had generally been in the best of health.

Permanent hospital accommodation was arranged for at St. Boniface, and tents were kept at the camps in case of necessity.

R. B. Anderson, M.D., was the medical supervisor of this work.

Rossburn—Clanwilliam Extension—(Grading line from end of dump to Rossburn).—Messrs. McDonald & McWilliam were the contractors here.

About three hundred to four hundred men were employed hereon, who were divided over the various camps, lodged in tents, and supplied with good substantial food, by the contractors.

There had been no outbreak of contagious or infectious disease, with the exception of five or six cases of typhoid fever, and the health of the men was generally good, but the sanitary condition of the camps was not what it ought to have been, and the chief medical officers of the company have promised to see to that in the future.

Permanent hospital accommodation was provided for at St. Boniface, and tents were on hand at the camps for hospital use.

H. W. McGill, was the medical supervisor of this work in the early part of the season, and was succeeded by Dr. Wray, but up to the present no report has come to hand from either.

Halifax and South Western Railway—(From Halifax to Barrington).—The proprietorship of this road is in the hands of Messrs. MacKenzie, Mann & Co., of Toronto. and is about completed from Halifax to Liverpool, but as part of the construction has been done during the past twelve months, I report thereon, following with the report of the medical officer of each section.

Chester Section—(Chester to Halifax).—This section was under contract to Mr. Argus Sinclair, C.E.

A considerable number of men were employed thereon, who were well housed under sanitary conditions, and boarded on good substantial food.

No outbreak of contagious disease had occurred in the camps, and the general health of the men was excellent. This section has now been completed.

Doctors Hebe and Morse, of Chester, N.S., were the medical supervisors.

Hubbard's Cove Section—(Bridgewater to Mahone Bay).—This work was also under contract to Mr. Angus Sinclair, C.E.

Quite a body of men were employed thereon, who were lodged and boarded by the contractor, in good shape, and the camps kept in sanitary condition.

There had been no deaths nor contagious diseases.

This section has now been completed.

Thomas Verner, of Hubbards Cove, N.S., was the medical supervisor.

Bridgewater Section—(From Bridgwater to Queen's County Line).—The Atlantic Contracting Company are the contractors for this work.

From 150 to 200 men were employed thereon, all comfortably housed and well boarded by the contractors. There had been no contagious disease, and the general health of the men was good. The Marine Hospital at Lunenburg would be used in case of necessity.

The section has now been completed.

H. A. March, M.D., was the medical supervisor of the men.

Liverpool Section—(Queen's County Line to Liverpool).—The contractor for this section was The Atlantic Contracting Company. Two to three hundred men were employed thereon, housed in tents and boarded by the contractors. There had been no contagious diseases, and the general health of the men and condition of camps were good. This section was to be completed to Liverpool this fall.

F. P. Smith, M.D., of Mill Village, was the medical officer in charge, but no report has been received from him for the past year's work.

Middleton and Victoria Beach Railway—(From Middleton, N.S., to Victoria Beach, N.S., about 40 miles).—This road is being constructed by Messrs. MacKenzie, Mann & Co., of Toronto, and will connect at Middleton with the Halifax and South Western Railway. A considerable number of men were employed thereon, who were well housed and well fed by the contractors.

The sanitary conditions of the camps were all that could be desired, the men keeping in the best of health as a rule, and no contagious disease having developed. Medical supervision was under the charge of two local physicians.

Intercolonial Railway—(Double tracking from Bedford to Windsor Junction, N.S.).—Mr. Reid McManus is the contractor. There are three camps covering the work, two of them being occupied by Italians, who boarded themselves. The central camp is at Rocky Lake, and the men there are well housed and well looked after by the contractors.

About 150 men were employed, the general health of whom was excellent, there being no contagious or infectious disease, with the exception of one case of diphtheria, and the sanitary condition of the camps was good.

The work was to be completed this fall.

Joseph J. Doyle, M.D., of Halifax, was the medical officer in charge of the men.

Prince Edward Island Railway, Murray Harbour Branch—(Charlottetown to Murray Harbour).—This branch is being built by the Dominion government, and was just about completed at the time of my visit. Mr. Willard Kitchen is the contractor, with head-quarters at Murray River, P.E.I.

Many of the men were living in their own homes, but the sanitary condition of all has been well looked after, and there has never been any contagious or infectious disease on the works.

Lester Brehant, M.D., of Murray river, has had general medical supervision over the men, but no report thereon has been received from him.

CANALS.

The works of this kind carried on by the Dominion government, and coming under the application of the Public Works (Health) Act, were five.

Galops Canal—(St. Lawrence river, west of Cardinal, Ont.).—Messrs. A. E. Cleveland & Co., are the contractors.

A considerable number of men were employed who were well housed, and boarded under the supervision of the contractors, and every sanitary precaution is taken in their interest.

The health of the men has always been good, and medical officers, and a permanent hospital, are within call by telephone.

Balsam Lake Division of Trent Canal, section No. 2.—These works are near the village of Kirkfield, Ont.

Messrs. Larkin & Sangster were the contractors.

This work is about finished, only a very few men being employed, all of whom live in their own homes, but still have the supervision of J. MacKay, M.D., of Woodville, Ont., or his assistant.

Balsam Lake Division of Trent Canad, section No. 3.—These works are near Gamebridge, Ont., and Messrs. Brown & Aylmer are the contractors.

Over 100 men are employed on this work, and are under the medical supervision of A. Grant, M.D., of Beaverton, Ont.

Hospital accommodations were provided, and the health of the men, and sanitary condition of the camps, were good.

Welland Canal—(Breakwater and rock excavation).—These works are at Port Colborne, Ont., and Messrs. Hogan and MacDonnell are the contractors.

From 100 to 150 men were employed thereon; most of whom boarded and lodged in the neighbourhood.

There had been no outbreak of disease on the works, and the health of the men had been good. Temporary hospital accommodation is at hand, but cases of serious accident or disease would be sent by rail to the hospital at St. Catharines by the contractors.

The medical men of Port Colborne can be secured in a few minutes if necessary.

St. Andrew's Rapids Canal—(Lock and dam).—Messrs. Kelly Bros. & Co., of Winnipeg, are the contractors.

Very few men are employed thereon, there had been no outbreak of disease, the health of the men being generally good.

Dr. Ross, of Selkirk, was the medical supervisor of the employees.

BRIDGES.

There are only two works of this kind being constructed, as far as I have been made aware. The Quebec bridge (from Quebec to Levis). The men employed live in their own homes, or board with surrounding families, and their health has been good, no contagious disease having broken out. Hospital accommodation and medical attendance is at hand in the city of Quebec.

The Hillsborough Bridge.—This is being built by the Dominion government, from Charlottetown, P.E.I., and is to be the connecting link for the Murray Harbour branch of the Prince Edward Island railway. Mr. M. J. Heney is the contractor.

Quite a body of men were employed thereon, who were well lodged and boarded; their health has been good, and no contagious diseases have developed. Hospital accommodation and medical attendance is within easy reach at Charlottetown.

OTHER PUBLIC WORKS.

Breakwater, Depot Harbour, Ont.—(Rip-rap foundations and addition).—This work has been carried on by the Dominion government and is under contract to

Messrs. Davis, Haney and Miller. There were comparatively few men employed thereon at the time of my visit, as the work is nearing completion.

The camps being in a high and dry location, their sanitary condition was excellent. There had been no contagious or infectious diseases, the health of the employees was of the best, the sleeping and dining quarters clean and airy, and the food supplied good and well served.

C. O'Gorman, M.D., of Depot Harbour, Ont., was the medical supervisor of the men and camps.

High Level Dock and Dredging (at Sorel, P.Q.)—This work is being constructed by the Dominion government and Messrs. McAuliff, Poupore, Malone and Weddell are the contractors. There are not a very large number of men employed and they live at their own homes, or board and lodge in the surrounding neighbourhood, or on the dredges.

No regular medical officer is necessarily employed, the same being obtainable in the town of Sorel, within a few minutes. The health of all has been good.

Dock and Ice-breakers—(City of Three Rivers).—This work was being constructed by the Dominion government, and was under contract to Mr. Randolph Macdonald. A considerable number of men were employed thereon, many of whom lived in their own homes, and the remainder were well looked after by the contractors. No contagious or infectious disease had occurred, and the health of the men was of the best. A regular medical supervisor was not necessary, and, in case of necessity, the general hospital at Three Rivcers would be used.

High Level Pier—(Montreal Harbour).—This work is being constructed by the Dominion government, under the supervision of the Montreal Harbour Board, and is under contract, to Messrs. Malone and Poupore.

A considerable number of men are employed thereon, who live in their own homes or board out. The health of the men had been excellent, and no special medical officer is employed, that and hospital accommodation being readily at hand in the city of Montreal.

In closing this, my annual report for the past twelve months, I beg to say that it might be advisable to take under consideration the suggestion of Dr. Baldwin, of Wetaskiwin, Alta., as to the non-employment of unvaccinated men on the public works of the Dominion, and also the suggestion of D. B. Neely, M.D., of Humboldt, N.W.T., that contractors on such works be obliged to dig temporary wells, where pure water cannot otherwise be obtained, the use of impure water now being apparently the only cause of epidemics of various diseases on such works.

I deem it a great pleasure to be able to again draw your attention to the general healthfulness and excellent condition of the men and camps on said works, and to the close attention given by companies and contractors in carrying out the Regulations of the Public Works (Health) Act, October, 1899.

I have the honour to be, sir,

Your obedient servant,

CHAS. A. L. FISHER,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

HEALTH OF ANIMALS.

REPORT OF J. G. RUTHERFORD, VETERINARY DIRECTOR GENERAL.

OTTAWA, October 31, 1904.

SIR,—I have the honour to present my annual report as Veterinary Director General for the Dominion.

In that branch of the public service under my supervision, the year just passed has been one of great interest and activity. Considerable progress has been made in the work of organizing the veterinary sanitary service of your department on lines commensurate with the rapidly growing importance of the live stock interests of the Dominion. While there is still much to be done in this direction, I think I am safe in predicting that the maintenance, for two years more, of a rate of progress equal to that which has characterized the last twelve months, will place this branch in a position to challenge comparison with any similar organization elsewhere.

The great economic value of veterinary preventive medicine is receiving each year more full and appreciative recognition by the governments of all civilized countries, and it behooves us, living as we do, in a country rich in flocks and herds, to see that our system is modern and our service efficient.

That you are fully alive to the importance of the work has been again demonstrated during the past year by the encouragement and endorsation which you have given to it, not only by your personal interest, but by obtaining from parliament additional legislation and increased money appropriations.

The public, and especially the stock-owners of Canada, are showing an awakened interest in the subject of animal health, and in most cases display an intelligent willingness to co-operate with our officers in the work of controlling and eradicating contagious disease.

This appreciation of our efforts towards improvement has naturally had a most beneficial effect upon the whole service, and I am glad to be able to report that, with few exceptions, the members of the staff have shown great interest in the work and performed their various and often arduous duties in a most satisfactory manner.

Much remains to be done before we can consider our machinery perfect, or, granting that impossible, even as perfect as we can hope to make it, but it is gratifying to be able to note a distinct improvement over the conditions existing at the date of my last annual report.

The drafting of new regulations and orders, some of which were naturally consequent on the passing of the revised Animal Contagious Diseases Act, in 1903, while many others were rendered necessary by circumstances arising from time to time, together with the constantly increasing correspondence and equally insistent executive detail of the office, have very fully occupied my time while in Ottawa during the past year.

The exigencies of the work also rendered unavoidable a great deal of travelling, as shown by the fact that in addition to numerous journeys in Eastern Canada, I was compelled to visit the North-west four times since March last, on one occasion extend-

ing the trip along the southern boundary of British Columbia and to Vancouver and Victoria.

In all nearly three months were spent in the ranching country; the details of the work there done, will be found in those divisions of this report dealing with special subjects.

Among the most important steps taken during the year, was the issuing on March 30 of a new order in council embodying carefully revised quarantine regulations regarding the importation and exportation of animals and all matters pertaining thereto.

This was rendered necessary, not only by the passing of the new Act, but by the fact that the regulations previously in force were, in many cases, inapplicable to present conditions and lacking in some most important details. Supplemented by a ministerial order placing certain much-needed restrictions on the importation of range horses from the Western States, these regulations have been found to work very satisfactorily.

Slight revision from time to time, owing to constantly changing local conditions, especially in the west, will, of course, be unavoidable.

The continued prevalence of glanders in some districts, and the appearance of a venereal diseases of horses in Alberta, rendered it necessary to ask parliament to amend the Animal Contagious Diseases Act, so as to permit of the payment of compensation for horses destroyed under certain circumstances. As you are aware, no opposition was offered to the amendment in question, which has therefore been embodied in the Act, and there marks a distinct advance in public sentiment on this question. The passage of the necessary contributory orders in council has also been obtained, and there is every reason to hope that this new departure will greatly simplify and accelerate the eradication of those diseases on account of which it was made.

As mentioned in my previous reports the system of inspecting stock for export to countries other than the United States was faulty, inasmuch as Canadian animals shipped via United States ports were permitted to leave the Dominion without having undergone examination by our officers. I am glad to say that this matter has now been adjusted, and that all Canadian animals intended for export to Europe or elsewhere outside this continent are now inspected before being permitted to leave this country.

Considerable progress has been made towards the improvement of quarantine facilities at St. John and Halifax, as well as at many points on the international boundary. A good deal more, however, must be done before these very necessary accommodations can be looked upon as satisfactory. This subject is dealt with in detail on page 14.

The Biological Laboratory connected with this branch has been found very useful in various ways.

A considerable saving is now being effected owing to the fact that all the mallein required for our work is manufactured at this institution instead of being purchased in the United States. Much more can be done in the same line, in fact the laboratory can, I feel certain, be made financially self-sustaining to say nothing of enormously increasing its usefulness in other directions by a slight addition to the staff and the erection of the much needed stable recommended in former reports. With a view to remedying the first mentiond deficiency Dr. Stork, our inspector at Toronto has at my suggestion, taken up the study of Bacteriology. It is my intention to bring him to Ottawa as soon as suitable arrangements can be made.

The report of Dr. Higgins at page 78 contains much interesting and valuable information.

The establishment last year of the station at Antigonish where, under the supervision of Dr. Pethick, there is being conducted a series of exhaustive experiments with a view to determining the exact nature and causes of Pictou cattle disease, has been fully justified by the results, even thus early obtained.

The full report of the experiments which is to be found at page 96 affords good ground for the hope that we will shortly be in a position to eliminate this peculiar malady from the list of diseases dealt with by this branch of your department.

Very few changes have been made in the personnel of the staff during the past year.

Dr. Moore is still at head-quarters where he continues to perform much important work in an eminently satisfactory manner.

In Ontario one additional inspector has been added to the regular staff, viz., Dr. Philps of Wallaceburg, who has been engaged under Dr. Perdue in dealing with hog cholera in the quarantined area and in the inspection of hogs shipped therefrom.

In Quebec no new appointments have been made. Dr. Whyte who was last year employed in Ontario has, however, been located in Sherbrooke which is one of our new quarantine stations and where he is almost constantly engaged in dealing with outbreaks of disease in the surrounding counties.

In Prince Edward Island, Dr. F. S. McDonald of Souris has been appointed an inspector principally for the purpose of dealing with Pictou cattle disease which malady has unfortunately made its appearance on the island; he is remunerated by fees.

In Manitoba, the occurrence of a few outbreaks of mange introduced by range horses has rendered necessary the appointment of several additional inspectors who, however, are paid by fees, their employment being of a temporary nature.

In this province, glanders has hitherto been dealt with by the provincial authorities, but in view of conditions there as compared with the rest of the Dominion, I would strongly recommend that an understanding be reached as soon as possible for the transference of the work to this branch.

The resignation of Dr. Hopkins in January last necessitated some re-adjustment of positions in British Columbia. It was fortunately possible to secure, by co-operation with the provincial authorities, the services of Dr. Tolmie of Victoria, as chief inspector for the province. Dr. Tolmie's high professional attainments and wide experience of live stock matters in British Columbia make him a most valuable addition to our staff while the terms on which he is engaged are such as to render the arrangement one of mutual advantage to this department and to the government of the province.

A considerable increase has recently taken place in the number of animals imported at Midway and other points in the Boundary district. This is largely owing to the improved facilities offered to immigrants and others for shipment to Alberta and other points in the North-west Territories by way of the Crows Nest Pass Railway.

In order therefore to prevent the introduction of disease, I deemed it advisable to again appoint an Inspector to guard the boundary in this district. Accordingly, Dr. C. M. Henderson was in January last, stationed at Greenwood and the Customs officers at ports of entry were instructed to utilize his services in all cases where inspection is necessary.

In this connection I may say that from information gained on my recent trip through this district, it will be necesary before next season, to station another veterinary inspector at Osoyoos as under existing conditions a considerable area of country is left without adequate protection from the introduction of disease by imported stock.

Dr. S. Hadwen of Duncan's, B.C., was, in June, appointed an inspector at Nelson, B.C., the services of the officer formerly stationed there having been dispensed with.

In the North-west Territories it has been found necessary to considerably extend the operations of the branch, and consequently, a number of new men have been enrolled in the Royal North-west Mounted Police as veterinary staff sergeants.

These additions bring the number of these officers in the force up to eighteen, including two now stationed in Yukon Territory. Eight of these are maintained by the police, while for each of the other ten, a sum of $2 per day is transferred from the

vote of this branch to that of the force. An allowance of $200 per annum is also paid from the funds of this branch to every veterinary staff sergeant on the list, except those stationed in Yukon Territory who, owing to extra living expenses there, receive $500. On representations made by the Commissioner, who last spring, pointed out that much extra work was imposed upon officers commanding districts by their having to oversee and report on the work of this branch, you authorized the payment from July 1, 1904, to each of these gentlemen, seven in all, of an equal annual bonus of $200. On similar grounds the allowance hitherto paid to the Commissioner himself, has been increased to $800, while the Assistant Commissioner in Yukon Territory receives $250 per annum.

The allowance heretofore made to Inspector Burnett, Chief Veterinary Officer of the force, has b en raised to $600, on the understanding that he is to be stationed at Regina and exercise a general professional supervision over our work in the North-west Territories.

Several veterinarians have been temporarily employed as inspectors during the period set aside for the compulsory treatment of cattle in the district quarantined on account of cattle Mange.

I need not point out that these changes involve a very considerable increase in expenditure which is, in this part of Canada, still further augmented by the special measures rendered necessary for the eradication of disease, by the payment of compensation for horses and by the provision of needed quarantine premises. I am, however, convinced that these outlays are in every way justifiable and that they will eventually prove to be in the best interests not only of the North-west, but of the whole Dominion.

The enormous extent of the territory and the conditions under which animals are kept render it a matter of extreme difficulty to obtain and maintain an effective control of any contagious disease which may find a foothold. Proof of this statement is, unfortunately, not wanting at the present time and it is only by the adoption and maintenance of the most energetic and systematic measures that we can hope to achieve the eradication of the maladies already existing and prevent the introduction of others.

The duties performed by our inspectors in the North-west Territories are frequently of a most arduous character, involving long journeys and especially in winter, fatigue and exposure.

The reports sent in by some of these officers reveal the performance of an extraordinary amount of hard work. Where all have done well, it would be invidious to select individuals for special mention, although were it not for this consideration there are several names on the list which I would be glad to distinguish in this way.

HOG CHOLERA.

I am pleased to be able to report a well-marked decrease in the number of outbreaks of hog cholera.

The stringent measures adopted two years ago and the care bestowed upon carrying them out in detail, have brought about most gratifying results. Had it not been for the occurrence of a series of comparatively small outbreaks in British Columba, the figures for the year just past would have presented an even more favourable contrast to those of the preceding twelve months than they do.

So far as Ontario is concerned, it is interesting to note that not only have our efforts to confine the disease to the area quarantined in the three south-western counties, been more successful than ever before, but that even within that area its ravages have been greatly lessened.

This state of affairs is, without doubt, largely due to the systematic policy now being followed with the view of preventing the spread of contagion not only from the infected district to outside points, but from infected farms to those in the vicinity.

A number of experienced salaried inspectors are kept on duty within the quarantined area with instructions to give immediate attention to any outbreak which may be reported to them, as also to keep close watch on all farms in the vicinity of such outbreaks.

On receipt of a report of the appearance of disease among hogs an investigation is at once made, and if cholera is found to exist, all the hogs on the premises are, as a general rule, promptly slaughtered, and the carcasses destroyed. If the circumstances are such as to warrant the inspector in permitting the keeping alive of healthy hogs which have not been in actual contact with the disease, he has authority to do so, provided that such hogs are afterwards slaughtered on the premises, but no hog can, under any circumstances, be removed alive from a quarantined farm or other place. Similarly hogs which show no signs of disease, may, if fit, be slaughtered for food purposes even when they have been in contact with animals suffering from the disease.

Quarantined premises must be thoroughly cleansed and disinfected to the satisfaction of our inspectors before they can be released or any fresh hogs brought to or kept thereon.

Until August of this year, compensation was paid for all hogs slaughtered, except those referred to above as being killed for food, at the rate of one-third of the actual value for those actually diseased, and three-fourths of the actual value for those in contact but not diseased.

In virtue of the amendment to the Animal Contagious Diseases Act, made last session, the compensation now paid is at the rate of two-thirds of the actual value for all hogs slaughtered, whether diseased or in contact.

This change lessens to a considerable extent the posibility of friction between the inspector and the owner of the diseased hogs, as it leaves no room for dispute as to whther the animals dealt with are actually diseased or not.

The disease being still very prevalent in the fall of last year, I deemed it advisable, as soon as the weather became cold enough for the safe shipment of dressed pork, to forbid the movement of live hogs from the quarantined area, and an order to this effect was therefore issued on November 1.

This action gave rise to some irritation among the residents of the district under restriction, necessitating several personal visits and a good deal of explanatory correspondence. I also made arrangements for the delivery at Farmers' Institute meetings of addresses on the subject of hog cholera by Dr. Perdue and the other regular inspectors in the quarantined area. These addresses were highly appreciated by the farmers and the benefit arising from them was so apparent that a number of special meetings were held at which the subject was fully ventilated and free discussion invited.

The result of these appeals to the intelligence and public spirit of the community was most gratifying, and no further difficulty was experienced in carrying out the regulations.

With the advent of warm weather, it was thought best to relax the quarantine so far as to permit the shipment, under certain definite conditions, of fat hogs consigned to slaughter houses and packing houses for immediate slaughter, a renewal of the policy pursued during the summer of 1903. This provision came into force on March 15, and from that date up to the present 286 cars, containing 24,143 hogs, have been inspected and passed by our officers. A duplicate of each certificate issued is mailed by the inspector to this office immediately after the inspection is concluded, and steps are then taken to have the car indicated thoroughly cleansed and disinfected immediately after being unloaded and before its return to ordinary traffic. I am of the opinion that our strict observation of this detail is largely responsible for the notable diminution this year of mysterious outbreaks in other parts of the country.

I am not at all satisfied with the conditions under which the heavy transit trade in American hogs across the Western peninsula of Ontario is carried on. It appears

to me to be something more than a mere coincidence that the great majority of outbreaks occur in close proximity to the railway lines, making a specialty of this traffic. During the past year, as also in 1903, considerable attenion has been given to the condition of cars conveying hogs entering Canada at Windsor and Sarnia. It is however, quite impossible to safe-guard the trade in this way alone. Droppings from hog cars are distributed all along the track even under ordinary conditions, while the practice followed in hot weather of drenching the loaded cars with water is a most effective means of distributing disease germs, should any exist, over large areas of farming country. The excreta deposited on the track can easily be conveyed to Canadian hog-pens by the boots of men, by dogs, birds or other animals, and an outbreak may thus be easily brought about entirely without direct contact.

As a possible instance of infection arising from this source, I quote the following from a recent report by one of our inspectors :—

'I visited the farm to-day and found twenty hogs, ten of which were showing very well marked symptoms of cholera. I commenced slaughtering, on post-mortem examination the ulcerations of intestines were very prominent, in some cases the lungs were affected. I had all hogs destroyed and buried six feet deep and covered with quick lime.

The attack is of an acute character, and I think possibly contracted from hogs passing through by rail on the Michigan Central Railway. Long train loads of hogs go over that line nearly every day and sometimes stop at the siding near the farm barns for a long time to let trains pass by. I cannot conceive how the disease could otherwise be communicated, as there have been no new hogs brought on the farm for a length of time, and no other cases of cholera within six miles, and that some time ago.'

Again, as stated above, several outbreaks of hog cholera have, during the summer, occurred in British Columbia. In every case but one, the disease was traced to hogs shipped from or via Calgary. Careful inquiry conducted by myself personally, as well as by other officers, has failed to discover any trace of hog cholera either in the Calgary district or in any of the various localities in which the infected hogs originated.

In March last, however, the Canadian Pacific Railway authorities notified me that they intended to bring a train load of American hogs through Canadian territory from North Portal to Sumas, B.C., en route to Seattle, and asked for permission to unload and feed at some convenient point. Authority was granted to unload at Medicine Hat, and instructions were sent to Dr. Hargrave, our inspector there, to superintend the operation and see to the after cleansing and disinfection of the yards. Dr. Hargrave reported that the train went through without stopping and that those in charge had decided not to unload in Canada.

This apparently closed the incident, and I was therefore much surprised to find, on visiting Calgary in April, that the hogs in question had been unloaded there and that a considerable number of them were dead on arrival, while others had died in the yards. Inquiry brought out the fact that the upper decks in three cars had broken down, with of course disastrous consequences, the unloading being therefore a work of necessity and mercy. No doubt many of the hogs were smothered or otherwise mortally injured through the accident of the broken decks, but it is certainly a striking coincidence that almost immediately afterwards cholera began to make its appearance in hogs shipped through these yards to points in British Columbia as far apart as Greenwood and Victoria.

This incident, while furnishing no direct evidence, constitutes, in my opinion, a strong argument in favour of the exercise of extreme caution in the handling of American transit hogs.

The fact that the unloading of these hogs at Calgary was never reported to the department shows the necessity for a more thorough and effective supervision of stock

yards and railway traffic generally than has hitherto been possible with the staff at my disposal.

Before leaving the subject I have much pleasure in reporting that the new regulations passed in March, last, providing for the inspection of hogs imported from the United States and the certification and quarantining of all those not consigned for immediate slaughter are now being systematically enforced and that the slight friction induced thereby has entirely disappeared.

I append a statement showing the number and location of the outbreaks of hog cholera which have occurred during the past twelve months.

NUMBER of Farms Quarantined for Hog Cholera, Twelve Months, ended Oct. 31, 1904.

Province.	County or District.	Township.	No. of Farms.
Ontario	Essex	Colchester South	8
"	"	Gosfield South	2
"	"	Rochester	2
"	"	Sandwich East	2
"	"	Tilbury West and North	18
"	Kent	Chatham	2
"	"	Dover	28
"	"	Harwich	29
"	"	Howard	1
"	"	Raleigh	3
"	"	Tilbury East	11
"	Lambton	Dawn	5
"	"	Enniskillen	1
"	"	Moore	1
"	"	Sarnia	1
"	Middlesex	Caradoc	1
"	Wentworth	Barton	1
"	Collingwood District		2
"	Niagara Falls District		2
"	Sudbury District		1
Quebec	Montreal District		2
"	Quebec District		1
British Columbia			27
Total			151

TUBERCULOSIS.

No new developments regarding this disease have been noted during the past year. The policy of testing in quarantine all cattle coming from countries other than the United States as also those originating in the last named country, when imported for breeding purposes or milk production, has been consistently followed, and appears to be working satisfactorily to all concerned.

All cattle reacting to the tuberculin test, when applied by our officers or by other veterinarians acting under the control of the department, are now permanently ear-marked. The mark chosen for that purpose, viz.:—a large 'T' cut out of the right ear, is becoming well known throughout the Dominion and I am satisfied that this system will be, in itself, the means of disseminating much useful knowledge regarding the disease among breeders and stockmen.

The Royal Commission appointed in Britain to investigate the question of the transmissibility of bovine tuberculosis to the human species, has published an interim report which, as was fully expected by all those having any practical experience of the subject, shows that the two diseases are practically identical, and that Dr. Koch's contention to the contrary was not well founded.

That public interest in this subject has not been adversely affected by the alteration of the departmental policy regarding it, is shown by the fact that 2,649 doses of tuberculin have been sent out this year, as compared with 2,391 doses in the preceding twelve months, and this in spite of the fact that the number of cattle tested for export to the United States has been considerably less.

There is no doubt that the dissemination of practical information regarding the nature of bovine tuberculosis, the contributory causes which lead to its prevalence under certain circumstances, and the best methods of preventing its spread, is having a well marked effect on the public mind and that a sound and healthy opinion on the subject is being gradually formed. Very few intelligent breeders now care to admit the existence of tuberculosis among their stock, and as under the methods now followed by the department it is scarcely possible for them to conceal its presence from our officers, the majority are adopting measures for its elimination.

During the year, there were tested for export, 427 head of Canadian cattle, of which number 36 reacted.

Of those imported from Europe and tested in quarantine, 191 in number, 52 reacted, and were earmarked and listed.

Of other cattle there were tested 490, of which 96 were found to react.

It must not be forgotten, however, that the herds comprising the animals last mentioned were almost all suspected of being tuberculous, the test being asked for on that account.

GLANDERS.

In those parts of the Dominion where glanders exists, the efforts of a number of our inspectors have been almost exclusively directed to the carrying out of measures for its control and eradication. The energetic policy adopted in 1902, of dealing promptly and thoroughly with every outbreak of glanders discovered in any part of Canada, with the sole exception of Manitoba where this disease is still left to the provincial authorities, has naturally resulted in the bringing to light of many centres of infection previously unsuspected. Notably is this the case in the North-west Territories, in the country surrounding Ottawa, and in some districts in the province of Quebec.

In these localities the disease has evidently been in existence for a considerable time as evidenced by the number of cases discovered by our inspectors. Lack of information as to its true nature has been largely instrumental in spreading the contagion, with the result that it is now found in a great many different localities. It is providential that the climate of Canada is, in a marked degree, unfavourable to the spread of diseases of this class as otherwise the conditions, now existing, would be very much more serious than they are.

Glanders, however, is under any circumstances, a malady in dealing with which slackness is unpardonable and therefore every possible effort is being made to stamp it out wherever found.

The system followed for the yast two years of testing with mallein all contact horses and, after destroying clinical cases, isolating and retesting those which react in the first instance, has received a fair and thorough trial, no pains having been spared in carrying out the details, irksome and laborious as they unquestionably are.

In spite of the difficulties surrounding its actual operation, this system has much to recommend it, and could, in my opinion, be successfully operated under circumstances which would permit of a close professional supervision of the reacting animals, especially if there were an accompanying provision for the payment of compensation for horses which after a reasonable time neither ceased to react nor developed clinical symptoms.

In a 'country of magnificent distances' such as Canada, however, there is a most undesirable element of risk inseparable from leaving reactors alive for any great

length of time, it being practically impossible to accord to them that watchful care which is the only guarantee of even approximate safety in dealing with horses infected with glanders. That this risk existed, I was well aware from the beginning, but, owing to the non-existence of any provision for compensation, I was glad to adopt any policy rather than that formerly followed, which entailed either the complete ignoring of contact horses or the slaughter without compensation of reacting horses, showing absolutely no external evidence of disease.

Needless to say, the former was the course almost invariably followed, with the result that glanders was continually being disseminated by the sale and movement of contact horses.

This branch of your department was, I think, the first among similar organizations to inaugurate officially, a systematic policy of testing repeatedly all horses found in contact or to have been in contact with clinical cases of glanders.

After two years' experience, I am satisfied that the results do not justify us in pursuing it any longer.

It is my intention shortly to publish a complete report covering the whole period during which the retesting system was in force. In this report will be included full details of our experience, together with all available statistics as to the proportion of horses ceasing to react and the greatly varying periods at which this result was effected.

Meanwhile, I may state that during the year ending October 31, 219 horses were destroyed on inspection, and 1,387 horses were tested, of which 280 were destroyed, while 420 were reserved to be retested. In this same period, 164 horses ceased to react, but of these, a considerable portion were carried over from the previous year.

I am satisfied that our work in the future will be much more effective, in view of the fact that through your appreciation of the importance of controlling this dangerous disease, and the intelligent generosity of parliament, we have been enabled to advance instead of retreating.

By the amending last session of the compensation clause of the Animal Contagious Diseases Act and by the passing of the contributory glanders order of September 19, a copy of which is printed herewith, it has been rendered possible to make a long forward step in the direction of eradicating glanders.

Under the new regulations, clinical cases of glanders are destroyed without compensation, and all contact horses are tested as heretofore, but for such of the latter as react and are killed without showing clinical symptoms, compensation at the rate of two-thirds of the actual value can now be paid.

The order contains a provision that, should the owner prefer it, inspectors may isolate and retest reactors, such retests to be made at the owner's expense, and with the distinct proviso that if clinical symptoms develop, the animals will be destroyed without compensation.

These regulations have been in force for too short a time to warrant me in giving an opinion as to their practical application, but I am convinced that they will prove much more satisfactory than any plan yet tried in Canada, or, for that matter, anywhere else. There is no doubt that they would be more favourably regarded by horse-owners if they contained a provision for the payment of compensation even at a reduced rate, for clinical cases. It should be remembered, however, that a clinical case is not only of no actual value, but is a constant source of danger to all other horses as well as to its owner, his family and any other human beings who may, directly or indirectly, come in contact with the contagion.

On the other hand, as proved by our figures, many horses which react to mallein, eventually cease to show even that evidence of disease, while others, although continuing to react, do not, for a long time, develop any external symptoms, but maintain a healthy appearance and continue in good working condition.

To destroy such animals without paying compensation is undoubtedly to inflict a serious hard-hip on the owner, while to let them pass out of control to, in all likeli-

hood, develop acute glanders at some future time and in the hands of some unsuspecting purchaser, is an alternative, repugnant in the extreme, to any right thinking professional man.

The present regulations render such risks unnecessary and will, I think, be found most helpful in our efforts to eradicate the disease.

The expense for some time, will undoubtedly be heavy, but in the long run the new policy, if honestly and faithfully carried out will, I am certain, prove incomparably more economical than any less thorough method of combating this insidious and destructive malady.

That an active campaign is called for is shown by the following figures :—

Horses tested	1,387
Reacted	420
Ceased reactors	164
Destroyed on inspection	219
" as reactors, although not showing clinical symptoms	27
" showing clinical symptoms at first test	253

Ontario.

Ottawa city and vicinity	10
Prescott	1
Middlesex	1
Ontario	2
Cardwell	3
Peel	1
Renfrew	5
Wellington	5
Russell	2
Grey	2
Haldimand	1
Markham	2
	35

Quebec.

Quebec	1
Wright	10
Pontiac	15
Dorchester	1
Labelle	1
Richmond	5
Ste. Hyacinthe	6
Drummond	1
Verchères	3
Bagot	5
Nicolet	5
Sherbrooke	1
Vaudreuil	1
	55

North-west Territories.

Regina district	218
Calgary district	42
Prince Albert and Battleford district	95
Fort Saskatchewan district	26
Medicine Hat district	23
	404
British Columbia	2
Yukon	3

SUMMARY.

Ontario	35
Quebec	55
North-west Territories	404
British Columbia	2
Yukon	3
	499

PICTOU CATTLE DISEASE.

Since the date of my last report, considerable progress has been made in the direction of determinating the true nature and causes of this remarkable malady.

Although for many years considered by my predecessor a contagious disease, and dealt with on that basis, there has always existed a firm and widespread belief among the residents of the infected area that it was due, in some way or other, to the ingestion of the weed known as 'Senecio Jacobea,' 'ragwort,' or as it is locally termed in Nova Scotia, 'Stinking Willie.'

During recent years, investigations carried on by Dr. Gilruth, Pathologist to the government of New Zealand, have practically demonstrated that the belief above referred to is well founded and that the disease, so far from being contagious, is caused by eating the plant in question.

The malady, which is a specific cirrhosis of the liver, was found to exist in New Zealand under exactly similar conditions to those accompanying its appearance in Nova Scotia, viz.:—within definite areas in which the ragwort was found in profusion.

After a series of tentative experiments, Dr. Gilruth has at last expressed definitely his opinion that the weed is to be considered the sole cause of the abnormal conditions produced in animals feeding in districts where it prevails to any considerable extent, and which conditions constitute the malady known in Canada as 'Pictou Cattle Disease.'

Although as stated above, this theory is strictly in accordance with the views of the majority of those residents of the Nova Scotia counties affected by its ravages, the lack of absolute certainty as to the identity of the New Zealand disease, and that found in Canada, taken in conjunction with the fact that experiments conducted a number of years ago by my predecessor in office had been considered conclusive proof to the contrary, I deemed it advisable to arrange for an exhaustive trial of the whole question.

I, therefore, with your approval, established last year in the infected area, an Experiment Station, by leasing at Cloverville, near Antigonish, a farm of 200 acres, on which the disease had frequently made its appearance in a severe form. After the erection of suitable buildings, and the completing of other necessary arrange-

ments, 34 cattle were purchased, all of which, except four, were obtained in districts well outside of the area known to be infected.

These cattle were divided into two main lots each containing 16 head, the other two being used for a special experiment, as will be shown later.

Sixteen head, including four purchased within the infected area, which I may add were the property of the owner of the station, were housed in an old stable in which no fewer than 36 cattle had previously succumbed to Pictou Cattle Disease. This lot of 16 was entirely fed on food brought from the province of Quebec. Four head received a full allowance of hay with a liberal ration of grain, four, a liberal allowance of hay without grain, and four a limited allowance of hay without grain, the latter being the usual manner in which ordinary cattle are wintered in the counties of Pictou and Antigonish.

Among these 16 cattle, no cases of the disease have occurred up to the present time, although by using a small isolated stable, a number of them have been brought into direct contact with acute cases of the malady purposely brought on to the premises with a view to ascertaining whether or not the disease is transmissible in that way.

The other 18 head were housed in an entirely new stable specially erected at a considerable distance from that already mentioned. Sixteen of them were divided into lots of four each, and treated as regards rations in an exactly similar way to those kept in the old stable except that the hay fed to them contained a considerable proportion of the dried stalks and leaves of Senecio Jacobea, no pains having been taken to remove this weed, as is invariably done by the more intelligent farmers of the district.

The result of this experiment is interesting, as three of the animals engaged in it have succumbed to Pictou Cattle Disease since July 19th last, full details being given in the report of Dr. Pethick (the officer in charge of the station) which may be found on page 96.

Of the remaining two cattle, one was fed on chopped ragwort alone, to which was added a small daily ration of bran, while the other was forced to subsist on oat straw, with a small bran ration. The former died of Pictou Cattle Disease on July 22, while the latter, at the date of this report, appears to be perfectly healthy.

Our experiments, therefore, so far as they have gone, appear to afford direct corroboration of the theory that the disease is due to the ingestion of ragwort, especially in view of the fact that contact experiments, which were carefully conducted, as shown by the detailed account of Dr. Pethick, were absolutely without result. The investigation has not, however, been carried on for a sufficient length of time to warrant us in making a definite announcement on the subject.

It is therefore my intention, with your approval, to continue the experiments for one, or possibly two years more. I think this course will commend itself to your judgment, especially in view of the fact that much valuable information is being secured not only regarding the causes of the disease, but with reference to its pathology, and its treatment, which latter appears to be successful to a limited degree and in incipient cases only. The cost of carrying on the work is comparatively trifling, in view of the large interests involved and the importance of securing reliable and definite knowledge regarding the prophylaxis of the disease.

For further details, I would refer you to the exhaustive report furnished by Dr. Pethick, who has shown most commendable industry and interest in the performance of his duties.

For the present, the disease is still being dealt with officially on the same lines as heretofore, except that advantage has been taken of Dr. Pethick's removal to Antigonish to utilize his services in dealing with cases occurring in that county, Dr. Townsend being still employed in a similar capacity in Pictou county.

A few cases have also occurred in the vicinity of Souris, P.E.I., where the services of Dr. F. S. Macdonald have been secured as inspector.

The following figures show the number of cases dealt with in each locality during the year, together with the amounts of compensation paid to owners :—

Nova Scotia	122	$1,416.66
Prince Edward Island	8	88 00
	130	$1,504.66

MANGE IN CATTLE.

In my report of last year, I ventured to express the hope that the measures which had been undertaken by individual owners for the suppression of mange in cattle would be successful in bringing about the eradication of the disease. As the season advanced, however, it became evident that the disease had still a firm hold and that more cattle were affected in southern Alberta and western Assiniboia than ever before.

The winter was a very severe one, particularly in the last-mentioned district, and there is no doubt that a good deal of the mortality which prevailed on the range last spring was due to the low condition and lack of hair, of many cattle affected with mange.

These facts, induced me to undertake an active campaign with the avowed object of stamping out this troublesome malady which, for the last fifteen years, has existed to a greater or less degree on our western ranges.

Being fully alive to the fact that such a campaign, to be successful, must have the hearty support and endorsation of the cattle-owners themselves, I thought it advisable to hold a series of meetings at the principal points in the infected area, at which, the whole subject could be freely discussed and a definite plan of action decided upon. Preliminary meetings were accordingly held during April at Medicine Hat, Lethbridge, Macleod and Calgary. At each of these gatherings, which were fairly representative of those most deeply interested, I pointed out the necessity for united and systematic effort and solicited the advice and assistance of those present.

The question was discussed in all its phases; the need for compulsory treatment, the most suitable season of the year at which to undertake it, the charges which might reasonably he made for treating stray cattle and those of careless or unwilling owners, the best preparations to use, the construction of vats, and many other details were gone into and fully dealt with.

I found that after the case had been fairly laid before them, the majority of the stock-owners favoured the adoption of active measures, but that they almost, without exception, dreaded to undertake the construction of vats and the expense of dipping their own cattle, owing to the danger of reinfection through the stock of others who, unless compelled, would, in all probability, neglect to do so.

After returning to Ottawa and discussing the whole matter with you, I made it my business to attend the annual meeting of the Western Stock Growers' Association, which was held in Calgary on May 12 and 13. Having submitted to the members of this important body a proposition comprising the passing of a departmental order demanding the compulsory treatment between September 1 and October 31, of all cattle within the infected area, whether actually showing signs of disease or not, resolutions were passed endorsing the proposed action and promising assistance in carrying it out.

The consent and approval of the leading stock owners having been obtained, it became necessary to secure definite information as to the boundaries of the infected area and to arrange for the extra funds needed to carry out the work.

It proved to be somewhat difficult to obtain the required information while the long parliamentary session delayed the appropriation and it was not until August 9,

that the Order was issued, leaving but a short time in which to arrange the final details.

Every means was taken to give the Order as much publicity as possible and although it is of considerable length, it was inserted as an advertisement in all the leading newspapers throughout the infected district, as well as in the agricultural journals published in Winnipeg.

Several thousand additional copies were printed for distribution and it was also embodied in the departmental bulletin, a copy of which is attached to this report.

Shortly after the Order was issued, I again went to the North-west and with the assistance of the Commissioner of the Royal North-west Mounted Police, who is in charge of the work of this branch in the North-west Territories, I arranged the details of the organization without which, it would have been impossible to carry out the scheme.

The infected area was divided into thirteen districts, each of which was placed in the charge of a qualified veterinary inspector, with authority to engage as many deputy inspectors as might appear to be necessary, for the effective enforcement of the Order.

Arrangements were also made for the supply of the necessary ingredients of the two preparations authorized by the Order. In this connection considerable difficulty was experienced in obtaining a sufficient supply of sulphur, but this problem, like most of the others connected with the scheme, was in the end, solved in a fairly satisfactory manner.

The attitude of the great majority of the stock owners was all that could be desired. Dipping vats were constructed in many different localities, the total number built during the season, including those erected by the department at Wood Mountain, Pendant d'Oreille, Coutts and Cardston was 196.

Very few districts, and those of comparatively small area, were exempted from the operation of the Order. Such as were exempted comprised, as a rule, small herds held by themselves closely under fence, and which had never been affected, nor in contact with, diseased animals. In a few instances, larger districts on the outskirts of the infected area and separated from it by well defined natural boundaries, were also exempted after careful investigation by the Veterinary Inspector in charge.

Some difficulty was experienced with small owners, who failed to understand the necessity for the universal and simultaneous treatment of all cattle within the infected area. A number of individuals of this class claimed exemption on the ground that their cattle showed no signs of infection, forgetting that the disease, to a large extent, is quiescent in the summer and fall, and that many cattle, although actually infected, do not develop symptoms until after the setting in of cold weather.

I am glad to say, however, that the majority even of this class of owners, became reconciled to the Order before the expiry of the time set for its enforcement. A few, however, held out, and by neglecting to make proper provision for treatment before the mild weather came to an end, managed to avoid compliance with the regulations. Instructions have b en issued to our officers to closely quarantine all cattle not treated except where legal ex mption was granted. This rule is also being applied to the cattle of a few large owners who, against their own interests, insisted on using dipping preparations other than those authorized by the Order. Some little harm was done by the canvassing agents of firms manufacturing patent dipping preparations who endeavoured, by misrepresenting facts, to convince the stock owners that they were being subjected to needless inconvenience and expense by being asked to use a hot lime and sulphur dip.

In this connection I would say that it was only after the most careful and thorough study of the experience of other countries, that I determined to insist on the use of the preparation in question.

In every civilized country where systematic efforts have been made to eradicate mange, the lime and sulphur dip has superseded all other preparations. Uuder the circumstances, it was out of the question to permit individual owners to use formulæ not

known to be thoroughly effective and reliable. Had any latitude been shown in this respect, it would have been impossible to differentiate between the various proprietary remedies on the market, with the inevitable result that many owners would have wasted their own time and money and endangered the herds of their more intelligent or conscientious neighbours by using cheap and ineffective preparations, thus paving the way for widespread reinfection and bringing the whole system of treatment ordered by the department into disrepute.

On the whole, the results of the Order have been very gratifying. While, in view of the prevalence of the disease and the enormous size of the infected area, its complete eradication in one season could scarcely be hoped for, a very great deal of good has been effected—owners have been thoroughly roused to a sense of the importance of getting rid of the disease, and have in most cases overcome the great initial difficulty of providing adequate facilities for the treatment of their stock. They have largely benefitted by the experience of this year, having not only acquired a practical knowledge of the details of treatment, but discovered that, apart altogether from its effects in curing mange, the dipping so far from being injurious to the stock, is of great benefit in ridding them of lice and other parasites, which have hitherto done serious damage by preventing thrift and retarding the laying on of flesh.

The creation of a healthy public sentiment on this question will also be of incalculable benefit in another way, inasmuch as owners who have gone to the trouble and expense of erecting dipping plants and treating their stock will, in future, render every assistance to our officers by seeing that their more indolent or less intelligent neighbours are compelled to take similar precautions, so as to prevent reinfection of healthy animals.

The following figures will give some idea of the extent of the operations and the magnitude of the problem which had to be faced in making an honest effort to stamp out this troublesome malady, which has for so long been causing, both directly and indirectly, a large annual loss to the cattle owners of Western Canada.

411,061 cattle have been up to the present date, dipped once, while of these, 176,685 have received the second treatment called for by the order. If the weather remains open for a few weeks, it is altogther likely that all of those reported to have been dipped once will have their second treatment completed, and that a considerable additional number will still be dealt with.

To show the progress made I would ask you to compare the number of cattle treated this season, with the figures quoted in the report of the attempt made in 1899 to enforce a similar policy. During that season, 686 head were dipped at Rocky Coulee, while the Commissioner of the North-west Mounted Police reported a total of 2,018 head quarantined and treated.

I am satisfied that from this time on, there will be no great difficulty in dealing with mange. The securing of the good-will and hearty co-operation of the owners is a decided step in advance which will doubtless bear good fruit during coming seasons.

MALADIE DU COIT.

In March last, Inspector Burnett, Chief Veterinary Officer of the Royal North-west Mounted Police, reported, through the Commissioner of that force, the existence of Maladie du Coit in a stallion and several mares, the property of Mr. W. T. McCaugherty, residing near Lethbridge, Alberta.

This disease, which for upwards of a century has been well known in Europe, to which continent it was originally conveyed from Northern Africa, and also, it is believed, from Asia, first made its appearance in the United States in 1882, when a brown stallion was brought from France to Bloomington, Illinois, where he infected a large number of mares, who in turn conveyed the disease to several other stallions. The prompt measures adopted by the authorities proved effective in stamping out the disease in this particular district, although, unfortunately, a number of animals were

sold before the nature of the outbreak was fully understood. Through these latter cases, the disease was conveyed to various parts of the United States, with the result that, from that time until the present, occasional outbreaks, varying in extent and intensity according to circumstances, have been reported from time to time.

Until the present season, however, Maladie du Coit, or Dourine, properly so called, has never been definitely recognised in the Dominion, although an outbreak of venereal disease, which from its history and symptoms, as described by the veterinarians who treated the affected animals, seems to have been only a severe form of the benign affection known to the profession as Coital Exanthema, aggravated in some cases by concurrent Strangles, took place in 1887 and 1888 in the county of Kent, Ontario. This outbreak was investigated by Dr. P. H. Bryce on behalf of the Ontario government, but the evidence available was not such as to enable him to arrive at any definite conclusion as to its real nature. A careful study of his report, in the light of a somewhat extended professional experience of venereal disease in horses, has led me to the conclusion already stated, viz.: that the disease then seen was not Maladie du Coit.

The facts set forth in Inspector Burnett's report on the McCaugherty cases were, however, such as to lead me to suspect that the trouble in the Lethbridge district was of a very serious nature, and I therefore lost no time in making a personal inspection of the affected animals. Some difficulty was experienced in reaching the cases owing to the breaking up of the ice in the Belly river, and it was not until April 12, that I had an opportunity of seeing the diseased horses in company with Inspector Burnett. After a careful examination, I had no hesitation in confirming his diagnosis. Recognising, however, the serious nature of the problem to be faced, owing to the facility with which such a disease is capable of dissemination among horses on the open range, I deemed it advisable to eliminate any possible doubt before adopting stringent measures.

I therefore, with your approval, asked Dr. Salmon, Chief of the United States Bureau of Animal Industry, to authorize or recommend a veterinarian, having practical experience of the disease, to visit Lethbridge for the purpose of making an examination of the cases then in hand. Dr. Salmon, very kindly and promptly, placed at the disposal of this department the services of Dr. E. T. Davison of Omaha, Nebraska, who is the inspector in charge of all outbreaks of Maladie du Coit occurring in the United States.

I had returned to Ottawa for the purpose of consulting you on this and other matters, but went back immediately to Lethbridge, meeting Dr. Davison there on May 6. This gentleman, on examination of the infected animals, had no hesitation whatever in pronouncing the disease to be Maladie du Coit, as shown by his official report, a copy of which was kindly furnished to me by Dr. Salmon. See page 69.

On obtaining this additional evidence, I immediately took such steps as, in my opinion, were best calculated to keep the disease under control, and prevent its spread among the valuable breeding herds of Alberta and Assiniboia. Dr. Hargrave, of Medicine Hat, who had, since my former visit, been engaged in inspecting all mares served by the infected stallion, and generally collecting information as to the conditions in the district, and who, I may say, was also firmly convinced that the disease with which we were dealing was actually Maladie du Coit, was present with Inspector Burnett and myself on the occasion of Dr. Davison's visit, so that I had the benefit of the valuable advice and assistance of these three gentlemen in formulating the policy adopted.

As at that time no provision existed for the payment of compensation for horses destroyed on account of disease, and as many of the affected mares were of considerable value, and their destruction, even if deemed advisable, would have involved t tremedous loss to their owners, there was no alternative but to place them in quarantine, under such restrictions as would preclude the possibility of their transmitting the disease, directly or indirectly, to others of their own species.

After going carefully over the ground, I decided on the establishment of a temporary quarantine station on the Old Man river, a short distance above McCaugherty's ranche, in which the affected mares could be kept safely under fence. After negotiating with the Department of the Interior and the Hudson's Bay Company, who owned the land required for this purpose, I was enabled to make arrangements for the fencing of some 1,800 acres, with a frontage on the Old Man river affording watering facilities.

Until the fencing of this area could be completed, I arranged with Mr. McCaugherty to keep all infected mares, whether his own property or not, inside his fenced pasture. I also engaged his services, and those of another man, instructing them to make a thorough inspection of all mares and stallions running in the neighbourhood of Lethbridge, and to secure and isolate, as above indicated, all showing the slightest symptoms of maladie du coit.

As a number of stallions were also reported to be at large on the range, I further authorized Mr. McCaugherty to collect all animals of this class, returning such as could be identified to their owners for safe-keeping, and placing the rest in charge of the officer commanding the R.N.W.M. Police, Lethbridge district.

A considerable number of stallions were taken up in this way, of which several were castrated, with the approval of their owners. I regret to say that the inspection conducted, as above mentioned, under the supervision of Inspector Burnett, brought to light the fact that a large number of mares running on the open range, were affected, to a greater or less extent with a venereal disease strongly resembling that seen in those bred to the McCaugherty horse. All of these suspicious cases were closely quarantined, the majority of them being held, either in Mr. McCaugherty's pasture or in the new quarantine ground, while the remainder were isolated upon the premises of their owners.

Under the authority of the Animal Contagious Diseases Act, 1903, the following regulations were brought into force early in the season, and every effort was made to carry them out in their entirety.

REGULATIONS RELATING TO MALADIE DU COIT.

Authorized by Order in Council dated the 8th day of July, 1904, in virtue of 'The Animal Contagious Diseases Act, 1903.'

1. Every owner, breeder or importer of, or dealer in horses, shall on perceiving the appearance of maladie du coit, among the animals owned by him or under his special care give immediate notice to the Minister of Agriculture and to the nearest Veterinary Inspector of the Department of Agriculture of the facts discovered by him as aforesaid.

2. Every veterinary surgeon practising in Canada shall immediately, on ascertaining that an animal is affected with maladie du coit, give similar notice to the Minister and to the nearest Veterinary Inspector.

3. In the Northwest Territories the notice required to be given by the two preceding sections of these regulations shall be deemed sufficient if given to the Commissioner, Assistant Commissioner, or other officer of the Northwest Mounted Police force, or to one of the Veterinary Staff Sergeants of the said force.

4. No entire horse more than one year old shall, after the passing of this order, be permitted to run at large on unfenced lands in the territory of Alberta, or in that portion of the territory of Assiniboia lying west of the third principal meridian, and any owner of horses failing to comply with this order shall be deemed guilty of a breach of these regulations and of the Animal Contagious Diseases Act.

5. Any entire horse more than one year old found running at large within the area defined above, may be seized and held on the order of any duly authorized Veter-

inary Inspector of this department, who shall forthwith when ever possible notify the owner of the said horse of such seizure, and the said horse if not claimed within thirty days of such seizure, may be castrated, and no indemnity shall be allowed to the owner in case of damage arising out of or resulting from said castration, seizure or detention.

6. No animal which is affected with maladie du coit shall be permitted to run at large or to come in contact with any animal which is not so affected.

7. Any Veterinary Inspector or other duly authorized person may declare to be an infected place within the meaning of the 'Animal Contagious Diseases Act, 1903,' any common, field, stable, or other place or premises, also any market, railway yard, stockyard, pen, wharf, railway car or other vehicle where animals are found which are affected with maladie du coit.

8. Every Veterinary Inspector or other duly authorized person shall have full power to order animals affected or suspected of being affected with maladie du coit to be collected for inspection, and, when necessary, to be detained and isolated or otherwise dealt with in accordance with the instructions of the Veterinary Director General.

9. The expenses of and incidental to the collection, isolation, seizure, castration or otherwise dealing with horses for the purposes of these regulations, shall be borne by the owners of the animals, and if advanced by the Inspector or other authorized person shall, until paid, be a charge upon the said animals.

10. No animal shall be removed out of an infected place without a license signed by an Inspector or other duly authorized person.

11. The Veterinary Director General may, from time to time, order the slaughter, castration or other disposition of animals affected with maladie du coit.

12. Every person who violates any provision of these regulations shall, for every such offence, incur a penalty not exceeding two hundred dollars.

J. G. RUTHERFORD,

Veterinary Director General.

Department of Agriculture,
Ottawa.

In order, further to meet the peculiar conditions with which the department was, for the first time, confronted, it was deemed advisable to provide means whereby, in the event of slaughter being rendered necessary, reasonable compensation might be paid to the owners of infected animals. An amendment to the Animal Contagious Diseases Act was therefore introduced and became law on receiving the Royal Assent in the prorogation of parliament on August 10. As soon as possible thereafter I proceeded to Lethbridge for the purpose of inspecting the quarantined mares with a view to having such of them as presented unmistakable symptoms of maladie du coit dealt with in a suitable manner. I was fortunate in having present at this inspection, Dr. Veranus A. Moore, Professor of Comparative Pathology at Cornell University, as also Dr. Kelly, State Veterinarian for New York, and Dr. Knowles, State Veterinarian for Montana.

As I was, at the same time, engaged in organizing for the carrying out of the Compulsory Mange Dipping Order, which involved the employment of a considerable number of the regular veterinary inspectors, as also of several other western veterinarians, I thought it advisable to make my temporary headquarters at Lethbridge, and to arrange for these gentlemen to meet me there. By so doing, I was able to largely economize time, and also to afford these officers the opportunity of examining the cases of maladie du coit, so that they might be able to recognize the symptoms if shown by horses in the various districts of the Northwest Territories to which they are from time to time called in the performance of their duties.

In all, twelve veterinary surgeons were present during the first stage of the inspection, which I may say occupied altogether a period of nine days. In this time 258 mares were carefully examined, it being necessary in every case to secure the animal in a squeezer, which, along with suitable corrals, had been erected on the quarantine ground.

In view of what I had seen earlier in the season, and of the opinions as to the nature of the disease, an expression of which has already been laid before you, I naturally expected to find at least some of the animals to have developed acute symptoms, especially as a number of the most severe cases seen in April and May had shortly afterwards succumbed.

I was therefore greatly surprised to find that, not only were there no well marked cases among those quarantined, but that many of the animals which had been apparently severely affected at the time of my previous examination, had improved in a marked degree. While, almost without exception, each of the animals examined on this occasion showed abnormal vaginal conditions, there was not among them any one case sufficiently pronounced to warrant me in ordering its destruction.

After careful consideration of the whole matter, I decided that the best and safest policy to pursue under the circumstances was to continue to hold all suspects in quarantine for a sufficient length of time to enable us to decide as to whether or not we were actually dealing with maladie du coit, or with some other, and possibly less malignant, form of veneral disease.

In reaching this decision, I was influenced, not only by the natural and reasonable aversion felt by every right thinking man to the destruction of life and property, but by the consideration that the adoption of a policy of slaughter would be an official acknowledgment by this department of the existence of maladie du coit among the horses on the western ranges, an admission which I am compelled to hesitate in making, in spite of all the evidence already advanced in its favour.

A policy of slaughter, once adopted, would have to be constantly carried out, and while this would be well enough if fully justified by facts, it would, I think, be unwise in the extreme to take even the first steps in this direction without being absolutely certain that the conclusions leading to it were unquestionably correct.

By keeping the suspected animals alive for a period long enough to fully demonstrate whether or not they are really affected with maladie du coit, the question of the existence or non-existence among Canadian range horses of this virulent malady can be settled in a much more satisfactory manner than by ordering their destruction on grounds, as to the soundness of which even the slightest suspicion can be entertained.

I have, therefore, with your consent and approval, made arrangements for the continuing of the quarantine of the suspected animals during the coming winter, in the expectation that before the advent of next spring more satisfactory evidence than that now in our possession will be available.

To those unacquainted with the literature and history of maladie du coit, it may seem remarkable that so much hesitation should be evidenced in reaching a decision, especially where so many animals are affected. As a matter of fact, however, although this disease has been known to the veterinary profession for upwards of a century, our information regarding its true nature is, even now, exceedingly imperfect.

Although researches by veterinary scientists in Europe, in Africa, and more recently still in India, have apparently demonstrated that it is due to a blood parasite resembling to a marked degree those which cause surra in Asia and magana in Africa, two of the most fatal maladies affecting horses, the presence of this specific tryanosoma has never, so far as I am aware, been detected in America, in spite of the fact that the disease seen on this continent is otherwise apparently identical with that observed in the old world.

In this particular outbreak, Dr. Veranus Moore, one of the most skilful bacteriologists in America, was unable to detect any trace of the presence of the parasite.

although he made many examinations of the blood, the vaginal mucus and other fluids taken from the mares at Lethbridge. He also carried with him to Cornell, a number of specimens and slides on which he was kind enough later to furnish me with a full report, without, however, being able to give any definite information as to the nature of the affection.

In view of these facts, therefore, one can only depend upon careful observation for a confirmation of the diagnosis of maladie du coit, so far at least as this country is concerned.

The difficulty which we are experiencing in reaching a decision in Alberta is by no means singular, as similar uncertainty has attended the great majority of the outbreaks observed in the United States. It must be remembered that maladie du coit is a disease which is not indigenous to North America, and, like other exotics, may possibly assume an entriely different character from that shown in its natural habitat.

The highest authorities in other countries consider it an incurable disease, and although it was at one time thought that a small percentage of the animals affected might recover under favourable conditions, later experience has shown that such recoveries were more apparent than real and that animals thought to be cured are still, after long periods of seeming health, capable of transmitting the affection to others, either by the act of coition or by artificial inoculation.

In 1899, Surgeon-Major Schneider and M. Buffard, Military Veterinary-Surgeon of Oran, Algeria, conducted a series of exhaustive experiments, and demonstrated the possibility of transmission through inoculation and otherwise, with blood and other fluids taken from both chronic and acute cases, their opinions being endorsed by the late Professor Nocard and other eminent European scientists.

More recently still, in 1902, Veterinary-Major Pease, C.V.D., of the Punjab Veterinary College, has further corroborated the views of the French investigators. The following quotation from Veterinary Captain F. H. L. Baldrey, Veterinary Record, October 10, 1903, affords so clear and concise a synopsis of our present day knowledge regarding the disease, that I feel justified in reproducing it here:—

'The cause of the disease is a trypanosoma similar to the Surra parasite, and it is conveyed from diseased to healthy animals mainly during the act of covering. The symptoms in the horse are very insidious. It commences in a mild manner, attacking only at first the external genital organs; this is soon followed by enlargements and swellings, then by an eruption somewhat similar to nettle rash. Finally it affects the lumbar nervous system, causes nervous degeneration, emaciation, paralysis of the hind limbs, and death. Although the horse is able to cover some time after affection, there is no doubt that he is unable to propagate, even though there be barely any clinical symptoms of his being affected. The disease is, as far as we know, incurable, and moreover, the horse is a source of infection to mares, the latter contingency being an extreme danger, as to any one without professional training, the primary symptoms are almost unnoticeable.

'In mares the diagnosis is even more difficult and the insidious nature of the disease more marked than in the horse. They are nevertheless capable of conveying infection from the first onset of the disease, from which time they also appear to be sterile. This it is that makes the question such a serious one to deal with. The difficulty of localizing or saying definitely how far it exists can only be realized when we take into consideration the number of mares in outlying districts who are seldom seen by any one acquainted with the disease, any if they are, fail to show any symptoms to an ordinary observation.

'Every precaution is, no doubt, being taken, but the incurability of the disease, the fact of its rendering animals sterile in the very early stages, and the impossibility of saying to what extent it definitely exists among the mares of the country render it a decidedly difficult matter to combat.'

The experience of veterinarians dealing with this disease in countries nearer home, has been of an exactly similar nature. It is, I understand, the intention of

Dr. Salmon to publish shortly a bulletin containing a full account of the investigations carried on by the Bureau of Animal Industry during recent years, and I have no doubt that, when this work appears, it will furnish much information of great value to us in Canada.

The disease has undoubtedly been introduced to Alberta by animals from the United States, although careful inquiry has failed to discover the exact channel by which it gained entry. This is not a matter for surprise, in view of the insidious nature of the disease, and the difficulty of detecting its manifestations in its earlier stages or in chronic cases.

As repeatedly stated above, the disease is generally considered incurable by those best qualified to judge, no satisfactory treatment having, as yet, been discovered, although apparent recovery occasionally takes place. This being the case, even in countries where the disease is indigenous, it is possible that under the climatic and dietetic conditions of Alberta, which, in summer at least, are almost perfect, the virulence of the disease may become so modified as to render recovery more frequent than in other less favoured districts. Unless, however, the recovery is complete and permanent, such modification may prove to be anything but a blessing, as it will be certain to render recognition more difficult, and in this way favour the perpetuation of the contagion in unsuspected chronic cases likely to cause periodical outbreaks of a mere virulent type.

Copy.

RUSHVILLE, NEB., May 14, 1904.

Chief of Bureau of Animal Industry,
Washington, D.C.

SIR,—In accordance with instructions received, I went to Lethbridge, Alberta, for the purpose of conferring with J. G. Rutherford, Veterinary Director General of the Dominion of Canada, in regard to suspected outbreak of maladie du coit among horses in the vicinity of Lethbridge. I examined such suspects as were available, and have no hesitation in confirming the diagnosis of Dr. Rutherford.

I found no good cases. However, considering in the aggregate the symptoms manifested by different individuals, does not leave room for a reasonable doubt as to the character of the disease. At the ranch of W. T. McCaugherty, eight miles west of Lethbridge, I examined a herd of about fifty mares and one stallion. The stallion presented a general unthrifty appearance, was quite emaciated, eyes and nostrils weeping, scrotum thickened and of a doughy consistency, two plain cicatrices on under surface of penis just below inferior border of prepuce. No plaques showing, but owner gives history that would indicate that they have been frequently in evidence. Meatus highly inflamed, constant dripping of mucus from urethra, voiding of urine frequent and attended with considerable discomfort.

Of the fifty mares, about fifteen are quite suspicious. Several show vaginal discharge and defective muscular co-ordination. Several had small white spots on vulva and cicatrices on vaginal mucous membrane. One mare showed two well defined plaques. In addition to the symptoms which were in evidence, we have the history of a large percentage of abortions. Also the owner gave in detail the history of mare which had died two weeks previous, a case which, I judge from his description, had all the characteristic symptoms of an animal in the advanced stage of maladie du coit.

I examined a stallion at Macleod, the property of one Wm. Damon. This stallion's sheath was badly swollen, and had been so for about six months. This was the only suspicious symptom in evidence, and considered alone, would hardly justify one in regarding stallion as a suspect. However, I learned that this stallion had covered a mare afflicted with a venereal disease of some kind, and that another stallion, which had previously covered the mare died with some kind of a venereal affection.

The history of various suspects and current rumours would seem to indicate that the affection had been prevalent in Alberta for two or three years at least. The origin of the difficulty is at present, of course, only a matter of conjecture.

Very respectfully,

(Sgd.) E. T. DAVISON,
Inspector.

MANGE IN HORSES.

I regret to say that this disease has prevailed during the past year to a greater extent than in any previous season, at least, so far as information can be obtained from the somewhat unsatisfactory records of previous years.

Not only have a considerable number of outbreaks occurred in the Northwest Territories and Manitoba, but the disease has also appeared in widely separate districts in Eastern Canada. Investigation demonstrated that in almost every case the contagion was directly traceable to western horses, and in most cases to animals originating in the western portion of the United States. You will recollect that it was from this source that the infection originally entered Canada some three years ago.

Much valuable work has been performed by our inspectors in the stamping out of this troublesome and highly contagious disease, which in many cases owed its spread to lack of information among owners as to its true nature, and the measures necessary to be adopted in dealing with it.

A large number of animals have been successfully treated, and although the disease still exists in various portions of the Dominion, I am satisfied that we have it well in hand, and that the new regulations, issued during the year, with reference not only to the control of the disease in Canada, but to the more thorough inspection of western horses entering the Dominion, will enable us to entirely stamp it out in the not far distant future.

The large majority of outbreaks occurred in the Northwest Territories.

Directly attributable to western horses, the following outbreaks occured in Eastern Canada:—

Ontario	99
Quebec	34
New Brunswick	17

SHEEP SCAB.

I am pleased to be able to report that very few outbreaks of sheep scab have been reported during the year just past.

In December last, Dr. Frink, export inspector at St. John, reported that he had detected in a lot of sheep presented for export, one individual showing symptoms resembling those of sheep scab. The animal was at once traced to the point of origin, near St. Thomas, Ont., but a searching investigation by one of our regular inspectors failed to discover any evidence of disease in that neighbourhood. It may, therefore, be presumed that the animal detected by Dr. Frink was suffering from some cutaneous affection of a less serious character.

During the same month, an outbreak was reported by Dr. Bradshaw, of Napanee, to which prompt attention was immediately given, with the result that the disease was eventually stamped out by means of segregation and thorough treatment of the infected flock.

During September the appearance of a skin disease among sheep in the neighbourhood of La Baie du Fevre, in the county of Yamaska was reported by the Department of Agriculture at Quebec. An inspector was immediately sent, and as a result

of his investigations, a number of small flocks of sheep, the property of different owners, but which had been grazing together in a common pasture, were placed under quarantine and ordered to be treated.

An outbreak, affecting a small and completely isolated band of sheep, was also dealt with in British Columbia.

ANTHRAX.

Very few outbreaks of anthrax have occurred in the Dominion during the past season, and in every case where the existence of the disease has been reported to the department prompt action has been taken to prevent its spread. In the majority of cases outbreaks were dealt with by our regular salaried inspectors. The work of preventive inoculation is left in the hands of private practitioners, as I do not think it advisable to employ the departmental inspectors in this work.

A list of outbreaks reported is appended:—

Ontario:—Cornwall Co., Dundas (2).
Quebec:—Jacques Cartier, Quebec.
New Brunswick:—St. John.

Eighty doses of anthrax vaccine were sent out from the department.

BLACK-QUARTER.

There has been a remarkable decrease in the number of outbreaks of this peculiar disease, which from its nature can scarcely be dealt with under the provisions of the 'Animal Contagious Diseases Act.' A number of cases have been reported from various districts in Eastern Canada, but it has evidently prevailed to a very slight extent in the Northwest, as is shown by the following statement of the sales of vaccine.

Five hundred and seventy doses were sold by Dr. Hargrave at Medicine Hat, N.W.T., and 438 doses were disposed of by the Royal Northwest Mounted Police.

One thousand one hundred and fifty-five doses were sent out from the department. The total number of doses disposed of during the year was 2,163.

ACTINOMYCOSIS.

This disease is not now dealt with by the department except in so far as the exportation of infected animals is forbidden. It does not appear to prevail to a serious extent anywhere in the Dominion, and very few affected animals have been presented for export.

ACTINOBACILLOSIS.

A number of cases of this disease have been reported to the department and an interesting bulletin on the subject giving the result of the investigations conducted by Dr. Higgins, has been published; see p. 84. This is the first original contribution to the literature of the disease which has appeared on this continent, and has attracted favourable notice from those interested in the subject.

I do not think that actinobacillosis is likely to prove a serious menace to Canadian herds, the climatic conditions being evidently unfavourable to its spread, but the information rendered available by the investigation above referred to cannot but prove valuable.

SWAMP FEVER.

Owing to the lack of suitable cases, the investigation into the nature and causes of the disease known as 'swamp fever,' which for a number of years caused serious loss among horses in Manitoba and the Northwest Territories, has not been productive

of any definite results. It is fortunate that the principal cause of this failure in acquiring information is that mentioned above.

I am of opinion that, as cultivation advances and the low-lying country is drained, the disease will largely disappear.

Be this as it may, it is certainly much less prevalent than it was some years ago.

The report of Dr. Torrance, of Winnipeg, who in conjunction with Dr. Bell, provincial bacteriologist for Manitoba, has this work in hand, may be found on page 112.

EXPORT INSPECTIONS.

The total number of animals inspected during the past year for export to countries other than the United States, is considerably less than for the preceding twelve months. The falling off is explained by the reopening of the New England ports, which were closed from November, 1902, until August, 1903, owing to the existence of foot and mouth disease in several coast states. During the period referred to large numbers of American cattle and sheep were shipped from Canadian ports which, owing to the measures taken by this department to comply in every respect with the wishes of the Home authorities, remained open during the continuance of the outbreak.

The number of animals inspected has, however, been increased to some extent over former averages by the inauguration in February last of the practice of examining all Canadian stock destined for export via American seaports. The neglect of this precaution was always a serious defect in our system of export inspection, as was noted in my last report, and I was much gratified to obtain your approval of my recommendation that the present system should be adopted.

The change has considerably increased the work of our inspectors at Montreal, and has also necessitated the employment during the winter of some of their assistants whose duties formerly ended with the close of navigation.

The safe-guarding of our export cattle trade is, however, of such importance as to completely outweigh the trifling financial consideration involved.

The improved system of reporting inspections adopted last year has been continued, and has proved, from a departmental point of view, a great deal more convenient than that formerly in use. I am about to elaborate it still further by utilizing the reports sent in as the basis of a concise book record which will show the exact st[illegible] of the trade at any time, and enable us to identify immediately every consignment of stock and to note the inspector's comments regarding it.

To render the system complete, however, it will be necessary to improve on the present methods of marking inspected animals.

I regret that pressure of work has prevented the carrying out of the change in this detail suggested in my last report. On my way back from the Northwest in April last I met, by appointment, in Chicago, Dr. Baker, senior inspector at the port of Montreal, and with him visited the Union Stock Yards, where, through the courtesy of Dr. Dyson, the officer in charge, we were afforded every opportunity of observing the system followed by the inspectors of the U.S. Bureau of Animal Industry.

I hope to be able, in the near future, to introduce like methods and exactitude in dealing with Canadian export stock.

It gives me great pleasure to report that the duties of all the officers engaged in this important department of the branch have been performed in a most thorough and satisfactory manner.

The following tables show the number of animals inspected for export to all countries other than the United States. With the single exception of cattle for breeding purposes, which are shown under another head, stock exported to the United States is not required to undergo inspection by our officers.

TABLE showing animals inspected at the following Ports:

	Horses.	Cattle.	Sheep.	Swine.
Montreal to Great Britain	294	112,179	49,352	
Inspected at Montreal for shipment to Great Britain via Boston and Portland		30,627	32,254	
Quebec to Great Britain		2,103	875	
St. John, N.B., to Great Britain	31	29,920	22,750	
Halifax to Great Britain	30	6,510	937	
Charlottetown to Great Britain		22	3,378	
Montreal to South Africa	64	489	12	14
St. John, N.B., to South Africa		300		
Charlottetown to West Indies	1			
Halifax to West Indies	26	4	541	9
" Bermuda	105	15	654	32
" Newfoundland		45	165	13
Charlottetown to Newfoundland	58	897	2,057	35
	609	183,111	112,975	103

Total animals exported from above ports—296,798.

Of the above, 38,600 cattle and 17,669 sheep were from the United States.

ANIMALS rejected at the following Ports:

	Cattle.	Horses.	Sheep.
Montreal	233	3	115
St. John	62		17
	295	3	132

Of the above, 35 cattle at Montreal and 2 at St. John were rejected for actinomycosis, one at Montreal for tuberculosis, one at St. John for glossitis, and 68 at Montreal for mange.

Of the horses, two were rejected on account of influenza and the other for strangles.

The rest of the animals rejected were suffering from lameness, or injuries received during transportation, but showing no indication of contagious or infectious disease.

IMPORT INSPECTIONS.

IMPORT Inspections from Europe.

Port.	Cattle.	Horses.	Sheep.	Swine.	Goats.
Levis Quarantine, Quebec	286		370	144	57
Montreal		440			
St. John, N.B.	65	54		3	
Halifax	3	6		3	
Charlottetown					
Total	354	500	370	150	57

IMPORT Inspections from United States.

Port.	Cattle.	Horses.	Sheep.	Swine.	Goats.	Mules.
St. John, N.B.	1			2		
Halifax, N.S.		6				
Charlottetown, P.E.I.		4				
Niagara Falls, Ont.	5	2	105	7		
Point Edward, Ont.	54	229	630	41	7	
Windsor, Ont.	416	18	240	61		
Deloraine, Man.	132	245				5
Killarney	213	343	1	26		6
Emerson	404	1,352	14	37		4
Gretna	1	98				4
Winnipeg	4,300	5,850	177	285		500
Melita	81	276		8		3
Morden	90	93		3		5
Crystal City and Snowflake	410	476	6	23		15
North Portal, N.W.T.	10,594	7,493	99	796		586
Maple Creek	2,645	209	1,737			
Medicine Hat	104	146				
Wood Mountain	9	907				
Coutts	3,680	3,642	7,482	33		25
Cardston	2,278	2,111				5
Pendant d'Oreille	2,230	354	6,150			7
Lethbridge and Macleod	136	16				
Nelson and Rossland, B.C	256	404	3,670	71		2
Grand Forks and Midway	540	712	13,040	64		9
Gateway and Rykerts	547	993		39		4
Victoria	98	221	14,046	5		1
Vancouver and New Westminster	71	425	20,364	1		6
Total	29,295	26,625	67,761	1,502	7	1,182

IMPORT Inspections from Mexico.

Port.	Cattle.	Horses.
N. Portal	7,360	685

IMPORTATIONS FROM MEXICO.

The number of cattle imported from Mexico during the present season has been much less than that reported last year.

The new regulations issued last spring require intending importers to obtain a permit before bringing stock from Mexico to Canada. This provision, which was made to prevent the importation of stock from States, other than Chihuhua, will, in future, be rigidly enforced, an arrangement having been made with the governor of that State, whereby the introduction thereto of animals from surrounding territory is forbidden. The State of Chihuhua is reported by the United States authorities, and others equally well informed, to be free from Texas fever and other diseases of a contagious nature. Previous regulations, controlling importations from Mexico, continue in force.

QUARANTINE STATIONS.

I am pleased to be able to report a considerable advance in the direction of placing the animals' quarantine stations of the Dominion on a more satisfactory footing than has yet been the case.

At Halifax, after prolonged negotiations, an excellent site has been secured by the purchase of three and a half acres of land adjoining the branch of the Intercolonial Railway known as the Cotton Factory Siding. This property, situated on the outskirts of the city, but within the corporation, can be reached conveniently by rail from the Deep Water Terminus, thus affording a speedy and safe mode of transit for imported animals direct from the ship to the premises where they are to be isolated during the period of quarantine required by the regulations. The necessary buildings, which at this point need not be extensive, have not yet been erected, as it was only recently that the property came into the possession of the department.

At St. John, N.B., where hitherto no proper quarantine station has existed, such animals as landed at that port from time to time having been housed in a small, inconvenient and somewhat unsanitary building leased for the purpose, and to reach which it was necessary to drive them for some distance over the public streets, much better arrangements have now been made. A plot of ground, five and three-quarter acres in extent, has been leased at a nominal rental from the Department of Railways and Canals. This, like the new grounds at Halifax, is situated on a railway siding, so that animals landing at St. John can now be conveyed to the quarantine without being allowed to come in contact with any animal or thing likely to be the means of spreading disease. A few old buildings came into the possession of the department with the lease, and these are being repaired and fitted up for temporary use as quarantine stables. It is expected that they will serve the purpose for some years to come.

At Quebec, some small improvements have been effected in the quarantine station at Point Lévis which in most respects is everything that could be desired from a sanitary point of view. It is, however, as I have stated in previous reports, open to one serious objection, viz.: that as matters now stand, it is necessary to drive or otherwise convey animals for a considerable distance over the public highway before they can be effectually isolated to undergo the required period of quarantine. This is a most serious drawback to the efficiency of the institution, and I would again strongly urge upon you the advisability of arranging for the extension of the Electric Railway to the grounds, so that live stock can be conveyed direct from the steamer.

Sherbrooke and St. Johns, Quebec, have since the date of my last report been selected as quarantine stations for such classes of animals imported from the United States as are subject to detention. So far, however, no arrangements have been made in the direction of securing suitable grounds or buildings, the volume of trade affected being exceedingly small.

At Windsor, Ontario, a convenient site has been leased from the Canadian Pacific Railway Company, and a building, small, but sufficient for the needs of the trade, is about to be erected thereon.

In Manitoba, a new quarantine station has been erected at Emerson on a site which I personally selected last spring on account of its convenience to the lines of the two principal railways entering Canada at that point. This station consists, like others constructed during the past season in the West, and which will be mentioned hereafter, of spacious and substantial corrals, to which are added a squeezer for unbroken animals, a dipping vat, and a small shed for housing hogs in quarantine or cattle which have to be submitted to the tuberculin test. The construction of this new station will enable us to dispense with the use of the old premises at Fort Dufferin, which is inconveniently situated, and the buildings on which have for some time past been falling into serious disrepair.

In the Northwest Territories, stations, similar in character to that last described, have been constructed at Wood Mountain, Pendant d'Oreille, Coutts and Cardston. Arrangements were made last spring with the Commissioner of the Royal Northwest Mounted Police for the immediate construction of the stations above mentioned, as also of a similar one at Roche Percée, and funds for the purpose were placed at his disposal. Owing to various reasons, however, the construction of these stations was seriously delayed, and it was not until late in the fall that those at Wood Mountain,

Pendant d'Oreille and Coutts were available for use. Through difficulties regarding location, the construction of those at Roche Percée and Cardston has not yet been commenced.

In September last, I visited among other places in British Columbia, Gateway, Nelson, Rossland, Grand Forks, Midway, Vancouver and Victoria, and at each place selected a suitable site, and made preliminary arrangements for the construction of quarantine stations similar to those erected in Manitoba and the Northwest Territories.

The necessity for this departure is urgent, as owing to the large importation of live stock from the Northwestern States, in which various contagious diseases of animals are well known to exist, it is imperative that our inspectors should be placed in a position to detain and examine in a thorough and systematic manner all shipments in regard to which they may entertain any suspicion.

The construction of the corrals in British Columbia will be proceeded with as soon as possible in the hope of having them ready when heavy shipments recommence with the recrudescence of immigration in the spring.

CAR INSPECTION.

Much valuable work has been done during the year in securing the cleansing and disinfection of cars conveying animals from infected districts.

The higher officers of the railway companies have shown themselves on every occasion willing to meet the wishes of the department in regard to this matter. The same cannot be said for all their subordinates, upon whom it is, occasionally, very difficult to impress the importance of having suspected cars properly dealt with.

A great improvement has, however, been effected, through close and constant supervision by our inspectors. On several occasions during the year, suspected cars were returned to ordinary traffic in a dirty condition, but in almost every case, by a free use of the telegraph, they were traced and promptly disinfected before being again used for the conveyance of animals.

A distinct advance has been made in securing the cleaning and disinfection of all cars conveying cattle from the mange infected district in the Northwest Territories to outside points, for slaughter or export. There is no doubt that the use of these cars was formerly the means of conveying contagion to stockers' and settlers' cattle going west, creating an erroneous impression in the minds of owners in the range country that mange existed in the eastern provinces.

The officials of the Canadian Pacific Railway Company have co-operated with our officers in this work in a most gratifying manner.

STOCK YARDS.

A steady improvement in the stockyard accommodation of the Dominion has taken placé during the past year, although at some points, notably at Montreal and Vancouver, the existing arrangements are anything but satisfactory. The railway authorities, however, have promised that new yards will be constructed at both of these points in the near future.

The Canadian Pacific Railway Company did much valuable work during the past summer in thoroughly cleaning and disinfecting almost all of their yards from Winnipeg west.

They also, at my suggestion, set aside certain yards for the use of animals in transit from the mange infected area for slaughter or export, thus obviating the necessity of subjecting cattle shipped west to the risk of infection, when unloaded for rest or feeding.

It is my intention during the coming year to still further perfect the system of yard inspection, by appointing local officers with supervision over certain districts.

MEAT INSPECTION.

The establishment, on a small scale, of an export trade in meat has led to a demand for inspection certificates such as are supplied by the Bureau of Animal Industry, to persons exporting dead meat from the United States.

There are at present, as far as I am aware, no trained meat inspectors in the Dominion. I need scarcely point out that this lack of skilled experts will prove very awkward if the trade, which has now made a small beginning, develops as we hope and expect it may.

I would suggest that steps be taken immediately to remedy this defect by giving a number of our younger veterinary inspectors an opportunity of acquiring a thorough knowledge of the subject..

I think this might be done by establishing a course of instruction at the Biological Laboratory here, as I am satisfied that if given reasonable assistance, Dr. Higgins would be quite capable of imparting the scientific and technical knowledge required.

MISCELLANEOUS.

In addition to the special meetings called for the purpose of discussing with western stock owners, the question of the eradication of mange, and the annual meeting of the Western Stock Growers' Association, it was my privilege, during the year, to address several other important gatherings. Among these, may be mentioned the public meeting held in connection with the Fat Stock Show at Guelph, and the meeting of the National Live Stock Association which took place in Ottawa last March, at which time I also delivered an address on the breeding of remounts, before a gathering of these attending the Fat Stock Show.

For reasons which will be apparent to those who were present on that occasion, I have thought it advisable to append to this report a copy of the address in question which will be found at page 183.

During the same month, I addressed a meeting of Horse Breeders assembled in Toronto, at the time of the Spring Stallion show, on the subject of Stable Hygiene.

At the request of the management of the Dominion Exhibition which was held at Winnipeg in July, I officiated as judge in a number of light horse classes exhibited there.

In August, I was fortunate enough to be able to attend the annual meeting of the American Veterinary Medical Association which was held in St. Louis. This was a most successful gathering, at which were present many of the leading veterinarians of the United States and Canada. Several subjects of great importance from a veterinary sanitary point of view were discussed, among which may be specially mentioned, glanders, scabies and contagious abortion.

Regarding the two former, much valuable information was elicited, the combined experience of the veterinarians engaged in the work of state control of animal diseases being highly interesting and instructive.

With regard to the last mentioned malady much uncertainty still prevails, even among the highest veterinary authorities. The subject, while a most serious one, is not yet sufficiently understood to render government interference advisable or likely to be productive of satisfactory results.

A great deal of attention is, however, being devoted to the question, and it is to be hoped that before long it will be possible to formulate a definite and intelligent policy, having for its object, the control and eradication of this costly scourge.

It has also fallen to my lot during the year to take some share in the movement now in progress among Canadian veterinarians towards an improvement of the standard of professional education. This branch of learning, although of the most vital importance to the live stock interests of the Dominion, has so far received little encouragement or support from any public source. It is to be hoped that the indif-

ference heretofore displayed will ere long be replaced by an intelligent recognition of the necessity for according to Canadian veterinary education a status properly befitting its national importance.

I have the honour to be, sir,
Your obedient servant,

J. G. RUTHERFORD,
Veterinary Director General.

The Honourable
The Minister of Agriculture,
Ottawa.

REPORT OF THE PATHOLOGIST.

(CHAS. H. HIGGINS, B.S., D.V.S.)

OTTAWA, October 31, 1904.

SIR,—I have the honour to transmit this, my sixth annual report as an officer of the Department of Agriculture, my third as its Pathologist, covering my work from November 1, 1903, to October 31, 1904.

The Biological Laboratory has become a greater necessity, and we have successfully and economically undertaken the preparation of a biological product. Still greater advances can be made in the manufacture of these products, and it is our aim and intention to undertake the work just as soon as facilities and assistance will allow without interfering with the present routine of the laboratory. The statement of last year, that the most serious drawback to our work was lack of assistance, still holds true, and the positive assurance has been given that this defect will soon be remedied. The remedying of this defect will allow the taking up of new investigations on original lines which cannot fail to be of immense importance to the agricultural resources of this country. As we are at present situated, the consideration of original research, save in few exceptions, is impossible, the routine of the laboratory being such that the necessary time is not available for the careful and painstaking study of the problems confronting us.

Another need, which will soon be a necessity if our efforts are to yield practical results, is a suitable stable for experimenting on the animals susceptible to the disease or diseases which we may be studying, and it is essential that we have a building constructed in such a manner as to render it practically if not absolutely germproof, which precaution will render counter infections impossible. The absolute exclusion of counter infections can only be expected in a building constructed of impervious material. The need of such stabling accommodation was mentioned in the report of the Veterinary Director General of last year, and I will not further dilate upon the necessity of this feature in the practical results to be obtained from our investigations.

Our acetylene gas plant is still giving satisfactory service, although its capacity is taxed to the utmost and it will ere long be necessary to increase the installation to meet the constantly growing demands of this institution. The experimental stage in the use of acetylene gas for bacteriological and other laboratories has passed, and for our particular work there is no other gas which will meet the requirements as economically in isolated localities. There is absolutely no danger in such an installation provided there is exercised a similar amount of care as would be bestowed where ordinary coal gas is employed; indeed, the safety and ease with which this gas can be manipulated, together with the absence of a gas-like odor when burning (noted where

either coal or gasoline gas is used, due to the liberation of unconsumed hydrocarbons), are considerations of moment.

The further detailing of our needs as an institution is not pertinent to this report, for our growth has been healthy and will of necessity require further additions to our equipment proportionate with the work which we undertake.

During the past year there have been ninety-three series of specimens received for diagnosis and save in these instances where the diagnoses have indicated an economic importance, they will not be mentioned in this report. This material represents a smaller number of series than was received during the year preceding. The specimens were, however, of greater importance and representative of a greater variety of pathological conditions. This decrease in number was almost wholly due to the lessened prevalence of hog-cholera, the number of specimens received from suspected cases of this infection being but about half that of the preceding year.

The details of interest connected with our work and other remarks will be found under the various headings which follow.

CATTLE DIP.

The order relative to the dipping of range cattle for the eradication of mange, created the necessity of a means by which the strength of the dip could be determined. On the request of the Veterinary Director General, this work was undertaken. The initial step in this connection was the precipitation of the sulphur with a saturated aqueous solution of oxalic acid, but this method from the outset seemed too cumbersome for the needs of the inspector in the field, principally on account of the time consumed, it being necessary to wait at least half an hour for the precipitate to settle before an accurate reading could be made. Knowing that the density of chemical solutions bears a direct relationship to the amount of any given chemical or chemicals contained therein, the hydrometer test was used on several samples of dips, and it was found that when dips were prepared according to a definite formula and a given technique, the hydrometer readings would correspond. To more accurately arrive at definite results, several samples of dips, each of which had given a certain hydrometer reading, were sent to the chemical laboratories of the Experimental Farm with a request that the amount of sulphur contained in each be determined. The results of the chemical examinations went to show that there was a distinct relationship between the hydrometer reading and the percentage of sulphur in solution. The reading of the Canada Official Dip* with the hydrometer was 1023·5 and the chemical analysis revealed the presence of 1·61 per cent of sulphur in solution. The instrument which seems to be the most practical for this hydrometer test is the ordinary urinometer used by physicians, and the form having the thermometer blown in the instrument is to be preferred as the allowance for the correction necessary when the temperature of the liquid is above 60 degrees Fahrenheit, is automatically made, it only being necessary to add this correction to the reading on the stem of the instrument in the accurate determining of the strength of the dip. There is another point to be noted, namely, that in urinometers, water is reckoned as 0, while in the hydrometer it is considered as 1000. Thus a solution giving an hydrometer reading of 1023·5 would give a reading of 23·5 when using a urinometer.

Dip exposed to the action of atmospheric air rapidly decomposes and should for this reason be tested immediately before use. A thin coating of oil on its surface will prevent this decomposition should it for any reason be necessary to allow the dip to stand after preparation, for any length of time.

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* The Canada official dip consists of:—10 pounds fresh lime, twenty-four pounds of sulphur and 100 gallons (Imp. Br. measure) of water. In my experiments this mixture was boiled two hours.

Further experiments in the preparation of the lime and sulphur dips have been conducted along the lines mentioned by Dr. A. T. Peters, of the Nebraska Experiment Station. At the meeting of the American Veterinary Medical Association in August last he made the statement that by the addition of glycerine in the proper amount to the freshly fused lime and sulphur, the mass could easily be brought into solution at any subsequent time. In my experiments I have mixed all of the ingredients, including the glycerine and then boiled the same for a period of two hours. After the mixture had been boiled the requisite time it was made into cakes, the surfaces being coated with parafine. These cakes are easily dissolved at any subsequent time and the fluid after decanting will give the same hydrometer reading as that obtained by dissolving a cake in a similar amount of water immediately after its preparation. The preparation of the dip in this manner may have some advantages, in that it can be prepared where facilities are available and the cakes taken to the dipping vats where they can be dissolved, the only fire necessary being that required to bring the dip to the proper temperature as mentioned in Bulletin No. 10, page 7, on 'Mange,' prepared by the Veterinary Director General.

The formula used in the preparation of this 'tablet form' dip was:—

Fresh lime, 10 pounds.
Sulphur, 24 pounds.
Water, 10 quarts.
Glycerine, 5 quarts.

This must be boiled vigorously for two hours, during which time the evaporation will have been sufficient to make the mass of the proper consistency and may then be poured into a tin or other container for transportation. If it is necessary to allow this to stand for some time after preparation the surface should be coated with parafine to prevent decomposition on the surface. Prepared as above it can be diluted with one hundred gallons of water to make a dip of the proper strength.

ANTHRAX.

The services of the laboratory have been called upon repeatedly during the past year for opinions as to whether or not sudden deaths in certain cases were due to the Bacillus Anthracis. In only one instance has this infective agent been found. In this connection I desire to point out the necessity for more careful observation when animals are suspected of dying from anthrax. The possible causes of death other than anthrax infection should receive careful consideration, as it is much more difficult to make a diagnosis after a report of negative microscopical findings.

TUBERCULOSIS.

The services of the laboratory have been repeatedly called upon for the microscopical examination of tissues suspected to contain evidences of tuberculosis. The most important material of this nature consisted of some fowls sent in, that we might determine the cause of their unthriftiness. Tuberculosis was identified in two instances. A more detailed statement concerning this affection in poultry will be made in connection with poultry diseases.

The need for further investigations on tuberculosis in Canada are as pressing as ever, new lines have been suggested by various workers and we can with profit undertake original research.

TUBERCULIN.

During the past year there have been 2,649 doses of tuberculin sent from the laboratory to inspectors and others on the order of the Veterinary Director General, against 2,391 doses for the year preceding. Small quantities have been prepared ex-

perimentally and cultures have been kept growing with a view to the ultimate production of sufficient to meet the needs of the department. I append hereto a statement indicating the amounts sent out each month.

	1903-1904.
November	326
December	326
January	350
February	303
March	295
April	146
May	272
June	119
July	123
August	173
September	70
October	146
Total	2,649

GLANDERS—MALLEIN.

The most important work in connection with glanders relates to the production of mallein. There have been sent from the laboratory 3,153 doses on order of the Veterinary Director General against 1,353 doses of the preceding year. We have with the exception of 316 doses required when starting on this work, manufactured the whole of the supply needed to meet the demands of the department. The amount sent out does not include the entire production as it is our aim to supply a product that is fresh and potent, which has necessitated the throwing away of some of our manufactured product which may have been potent but which we did not wish to have used on account of its age. The average cost for the year has been eleven cents per dose as shipped from the laboratory. This estimate includes labour, gas and material with an allowance for the breakage of glassware, &c. The mallein previously supplied has cost twenty-two and one half cents per dose, with an additional expense for bottles, corks, labels and labour necessary in preparing it for use.

A monthly statement of the doses dispensed for the past year is as follows :—

November	291
December	40
January	135
February	155
March	203
April	184
May	412
June	422
July	75
August	560
September	305
October	371
Total	3,153

PICTOU CATTLE DISEASE.

Specimens have been received during the past year from eight suspected cases of Pictou cattle disease. These specimens were obtained, in four instances, from ex-

perimental animals (Nos. 16, 17, 8 and 11, laboratory numbers 271, 272, 285 and 286 respectively), of the Antigonish experimental station. For a statement as to the manner of feeding, care and clinical history of these four cases refer to the report of Dr. W. H. Pethick, Inspector in charge of the station.

The lesion associated with the disease, as pointed out by Osler, Wyatt, Johnson and Adami, is the cirrhotic condition of the liver. The deposit of fibrous tissue is noted chiefly about the smaller bile ducts (plate XIII) and there is atrophy of the liver cells. From this invasion of fibrous connective tissue about the bile ducts (peri-portal), we note also its deposit between the individual cells (peri-cellular). The lymph glands of the mesentery are somewhat swollen and contain bacteria, but present no marked lession. These bacteria, which are also found in the liver, were first thought by Adami* to hear a direct relationship to the affection, but have since been identified as a form of the Bacillus coli.* I have found these bacteria in the tissues and have also studied them in cultures. It is my opinion that they bear no relation to the cause of the affection, but gain access to the tissues through the lowered vitality and resistance of the cells.

The livers of the experimental cases have in every instance, presented lesions not distinguishable from the lesions above mentioned, which have in turn been studied by Osler, Wyatt Johnson, Adami and myself. Dr. Pethick has mentioned in a personal letter the presence of the stomach ulcers in these experimental cases. We cannot then, conclude otherwise, than that these experimental cases are true cases of Pictou cattle disease.

I present herewith three micro-photographs (plates XII, XIII, XIV) showing the lesions found in the liver of animals suffering from various stages of this affection. It will be noted that plate XIV is a micro-photograph of a section of the liver from experimental case No. 11 (laboratory number 286).

HOG CHOLERA.

Specimens of suspected hog cholera have been received from time to time with the request that an opinion be given as to the presence or absence of lesions. From the records of these cases the fact is noted that there have been fewer specimens sent in than in preceding years and I believe this is due to the thorough and effective manner of dealing with this affection during the past two years. Original investigations with this disease have not been pursued during the past year. A photograph of the lesions in a hog returning from St. Louis is found on plate XI.

VERMINOUS BRONCHITIS IN HOGS.

The prevalence of verminous bronchitis in hogs was mentioned in my report of 1902, and a great many lungs, infested with Strongylus paradoxus, the nematode worm causing this affection have been received during the year just ended. This affection seems little understood and is frequently mistaken for other conditions, when a careful search would reveail its positive agent. A microscopic examination is not required in its diagnosis. The nematode worm, Strongylus paradoxus, is described by Neumann as follows :—

'Mouth encircled by six lips, the two lateral being the largest. Male, 16 mm. to 25 mm., long; caudal pouch deeply bilobate, each lobe being sustained by five ribs. Spiculæ slender and very long. Female, 20 mm. to 40 mm., long with curved mucronated tail; vulva situated on a pre-anal eminence. Oviparous and ovoviviparous. Habitat, the bronchii of the pig and wild boar and also sheep according to Koch.'

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* Annual report of the Minister of Agriculture, 1894. Page 89.
* Annual report of the Minister of Agriculture, 1901. Page 132.

In an animal but slightly infested with these worms their presence might easily pass unnoticed, but an increase in numbers renders the symptoms more prominent. We may note evidences of bronchial catarrh with difficult and painful respiration. A loose cough may be observed when the animal is required to move. Recovery may take place spontaneously where the animal is vigorous and the parasites are few.

The treatment of this affection consists mainly in its prevention, from the fact that it is very difficult to use medicinal agents which will affect the parasites without endangering the life of the host. The animals should be allowed plenty of good clean bedding in a dry well-ventilated place. They should be removed to quarters not contaminated by the eggs which may be discharged with mucus from an infested animal. Once a certain piece of land is infected the hogs should be removed and the ground cultivated.

The diagnosis is very easy and the photographs (plates IX and X) will be of some assistance. The surface of the lung has a mottled appearance similar to that seen in broncho-pneumonia. In slitting open the bronchii worms are found and can easily be seen without the aid of a magnifying glass.

Where there is but a slight infestation, some searching may be required and the smaller bronchioles followed, when, if the worms are present they will be found curled up and surrounded by mucus, the secretion of which has been stimulated by their presence.

DISINFECTANTS.

A sample of disinfecting material was received at the laboratory and a report as to its efficiency forwarded to the department. The material in question being like a large portion of the disinfecting agents, of proprietary origin, as also were a number of those with which it was compared, and as it is impossible to publish results which will hold for all the material sold under any given trade name, there being, unfortunately, some unscrupulous manufacturers of these products, I do not deem it wise to incorporate these data in this report. The technique followed in determining the efficiency is essentially that of Sternberg with modifications to meet our requirements.

POULTRY DISEASES.

Poultry diseases in Canada have received very little attention with the exception of the admirable work carried on at the Guelph Agricultural College under the direction of Prof. Harrison. The subject is an intensely interesting one, and withal important, that the exact cause of any unthriftiness in a flock may be determined and intelligently dealt with. Since my first research on a disease at St. Anne de Bellevue, Que., in 1895, which proved to be very similar if not identical to the true European fowl cholera (which I may say is the only recorded instance of a disease so closely simulating that affection on this continent) every opportunity to study poultry diseases has been taken advantage of and much information has been gained with an important bearing on the diseases of other species of animals. I have during the past year examined many fowls sent to the laboratory and believe that much assistance has been rendered from the actual diagnosis of the condition present in the infected birds. Intestinal parasites have been common and will continue to be so till such time as those who aim to gain profit from the rearing of poultry learn that fowls must be kept under proper hygenic conditions if intestinal parasitic infestations and other diseases are to be avoided. The parasites most commonly found were round worms and tape worms. Of the round worms two varieties only have been identified, *Heterakis differens* and *Heterakis inflexa*. The former has been found in all save four birds examined, while the latter has been found in three instances only. The former does not necessarily exert any marked deleterious influence save when found in great

numbers. The latter when few are present may cause great emaciation and even death. Tape worms have been found quite frequently. Any of the worms are easily detected when present, by slitting the intestine open with a pair of scissors and gently washing in luke warm water. When parasites are found an effort should be made toward eradication as the droppings are infected. Individual birds may be treated with santonin if their value is sufficient to warrant such a proceedure.

Our most important work on poultry disorders was the identification of tuberculosis in two instances. In a fowl received from Enderby, British Columbia, and in one originting near Renfrew. In both cases the disease was well advanced, being generalized throughout the organs of the abdominal cavity. The tubercular enteritis with the nodules present in the liver and spleen are well shown on Plate VIII. There can be no doubt that a fowl infected to such a marked degree must have been a constant menace to all others with which it may have come in contact, as countless numbers of bacilli were present in the faeces. This is, I believe, the first identification of poultry tuberculosis in Canada. It has been identified by a worker at the Oregon Experiment Station* and by Moore and Ward † in California. Many suspected outbreaks have been reported, but with the exception of those indicated above, lack positive identification.

Those interested in poultry-raising should take great pains to determine the exact cause of any unthriftiness in their fowls, and if it is found that tuberculosis is present every means should be adopted for its eradication, otherwise the value of the flock will be greatly depreciated. Tuberculin has been shown by Ward‡ to be valueless in fowl tuberculosis. He has used with other tuberculins that prepared from Avian tubercle bacilli. If tuberculin were of value in diagnosing fowl tuberculosis, its use would be restricted to valuable birds and to experimental work, as its application would entail too great an expense for a testing out of infected birds in even a small flock. In its eradication one can not be too careful of their disinfecting measures. Its introduction into uninfected poultry yards should be guarded against by a careful consideration of the origin and history of any fowls which may be introduced and as an additional safeguard new fowls should be kept isolated and under observation for some little time before being allowed to run with other fowls. As a precautionary measure, good sanitary surroundings with plenty of sunlight, fresh air, clean water and good food will do much toward its prevention.

ACTINOBACILLOSIS.

The most important work of the year has been the preparation of a bulletin* on this disease, which has for the first time been described on the North American continent. Since its preparation, however, some additional data has been obtained, a brief résumé of which will be of interest.

In one case, a guinea-pig inoculated subcutaneously in the flank region, the characteristic lesions were present at the angle of the jaw. These lesions consisted of the fluctuating tumor masses with abscess formation, in the pus of which the peculiar granules were observed on microscopic examination. The external lymphatics were enlarged, but there were no microscopic internal lesions.

An outbreak has been observed in which many animals were affected simultaneously, and the only introduction into the herd was a steer which had changed hands a number of times on account of his general unthriftiness and the presence of a discharging abscess at the angle of the jaw. On seeing the animals, I made the provisional diagnosis, that the affection was due to the bacillus of Actinobacillosis, and

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* Proc. Am. Vet. Med. Ass., 1903, page 185.

† Avian Tuberculosis. V. A. Moore and A. R. Moore, Proc. Am. Vet. Med. Ass., 1903. Page 169.

† Ward. Proc. Am. Vet. Med. Assn., 1904. Rpt. Comm. on Diseases.

* Bulletin No. 1. Biological laboratory series. See page. .

this diagnosis was confirmed by an autopsy on a three-year-old heifer badly affected in the region of the throat and tongue. The history of the steer in question indicated that a number of animals in every herd with which he had associated had been affected similarly, but that they had recovered when treated with either the empirical lump-jaw remedies, or by potassium iodide in the hands of a veterinarian. The disease in the outbreak referred to was of a mild type and it was with difficulty that animals could be experimentally infected with the cultures obtained therefrom.

I believe that the climatic conditions peculiar to Canada are responsible for our not having more acute cases of this affection and for its easy control when it does occur.

In concluding my report, I desire to express my appreciation of the efforts of the Veterinary Director General, Dr. J. G. Rutherford, who has ever been ready and willing to offer timely advice and encouragement in the conduct of the laboratory work.

I have the honour to be, sir,
Your obedient servant,
CHAS. H. HIGGINS, B.S., D.V.S.,
Pathologist.

The Honourable
The Minister of Agriculture,
Ottawa.

(A. E. Moore, D.V.S.)

Ottawa, October 31, 1904.

Sir,—I have the honour to submit to you this, my annual report for the year ended October 31, 1904.

GLANDERS.

This year I have made 229 tests with mallein. The horses were all in small lots, in about seventy different places.

Horses tested for the first time			114
"	"	second time	56
"	"	third time	28
"	"	fourth time	25
"	"	fifth time	3
"	"	after being ceased reactors for one year	3

The total number destroyed was forty; seven of which were destroyed on clinical symptoms alone, and thirty-three after being tested. Of the thirty-three, twenty-six showed clinical symptoms of glanders; the remaining seven, which were free from clinical symptoms of the disease, were destroyed after the Order in Council of the 19th of September was passed. For these animals the owners received compensation.

I have examined a large number of horses clinically, especially in Ottawa, Hull and the surrounding country. In many of these cases the suspicious symptoms were due to distemper and in a few to diseased teeth.

MANGE IN HORSES.

In April, I discovered several horses in the city of Hull which were affected with Sarcoptic mange. While dealing with these cases, I was informed that there were

horses affected with the same disease at Caledonia Springs. I proceeded to Caledonia Springs where I found the disease on eight different farms, twelve horses being affected. In tracing the origin of certain diseased horses, I was obliged to go to Vankleek Hill. While there I visited Drs. Metcalfe and Irvine, who informed me that the disease was extremely prevalent in their district and that they had been treating it for some time. I obtained from them the names of all the people who owned horses that were actually affected, or whose premises had ever been infected. I then employed a most reliable guide and through his thorough knowledge of the people and the country was able to visit 60 farms where the disease actually existed, affecting eighty-nine horses. I visited a great many other farms where horses had been successfully treated, and ordered the disinfection of the stables, where it had not already been properly done. Where mange was found, I inspected the horses on all adjacent farms and in this way saw a great many horses in this vicinity. I found the disease usually in small centres from two or three farms to six or eight farms, often carried to these centres by horse traders.

As Vankleek Hill seemed to be the centre of the infected district, and diseased horses were coming to that place every day, I deemed it advisable to order the disinfection of all the public stables, tying sheds, blacksmith shops, and tying posts.

Many cases demanded persistent treatment and the people, with few exceptions, did everything in their power to assist me in stamping out this troublesome malady. The result of our work has been highly satisfactory, all cases that have been dealt with were cured, and disinfection promptly done.

Dr. Geo. Higginson co-operated with me and finally took entire charge of this outbreak.

During the year I quarantined and ordered ninety-five mangy horses tested. Eighty-nine being in the province of Ontario and six in the province of Quebec. Sixty private stables and thirty public places were ordered disinfected.

Six horses died, and several, being worthless were killed by the owners instructions.

Symbiotic scabies affected a large number of horses in one firm in the city of Ottawa ; they have been successfully treated.

TUBERCULOSIS.

I have tested sixty-seven head of cattle with tuberculin ; twenty being pure-bred cattle for export to the United States. Ten were diseased. Forty-seven were high grade cows which were for shipment to South Africa. One was diseased.

I ear-marked twenty-one reacting cattle which were tested at the owners' expense.

HOG CHOLERA.

I have dealt with only three outbreaks of this disease during the year. They were confined to three farms and only a few hogs were infected. No newly-infected districts came to my notice.

I visited one farm, where I found hogs to be suffering from verminous bronchitis.

SHEEP SCAB.

I have investigated one outbreak of sheep scab this year. The owner succeeded in stamping the disease out after considerable trouble. When I first visited this farm only one ram was very slightly affected. I quarantined all the sheep on the premises, however, and ordered the ram to be dipped. Later quite a number of the ewes became infected. The owner persisted in his treatment and finally cured them all. This might have been a very serious outbreak, as the owner is a large breeder of sheep, and makes

many sales during the year. This ram came from the Toronto exhibition and was found to be infected shortly after his arrival.

TYPHOID INFLUENZA.

In July it was reported to this department that many horses were dying at Garden River, Ont. Acting on instructions, I visited that place on July 30, and found about twenty horses belonging to one firm affected with typhoid influenza. I held a post-mortem on two cases and found the characteristic lesions.

Dr. McCann, of Mattawa, had charge of the cases, and was very successful in his treatment.

There were several other outbreaks of this disease in the neighbourhood of Sudbury, which were being treated by Dr. Taylor.

I have the honour to be, sir,
Your obedient servant,

A. E. MOORE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(M. C. Baker, D.V.S.)

Montreal, October 31, 1904.

Sir,—I beg to submit my annual report for the year ending October 31.

During the year I inspected and passed for shipment at the Canadian Pacific Railway stock yards, Hochelaga, 71,388 head of cattle and 31,732 sheep; only 14 swine were shipped, these being shipped to South Africa. There were 84,583 cattle and 29,079 sheep shipped last year when the shipments of cattle were exceptionally large owing to the embargo in Britain against cattle shipped from United States ports.

The inspection is distributed monthly, as follows :—

Months.	Ranche Cattle.	Domestic.	United States Cattle.	Canadian Sheep.	United States Sheep.
1903.					
November		8,243	1,350	6,740	
1904.					
November to May		18	300		
May		6,615	1,857	569	
June		7,442	1,212	3,150	
July	2,791	5,802	561	2,999	
August	9,673	4,753	234	3,446	
September	6,955	3,500	1,038	5,540	1,334
October	6,724	2,186	134	7,293	661
Total	26,143	38,559	6,686	29,737	1,995

Grand total for cattle	71,388
Grand total for sheep	31,732

During the year there were rejected as unfit for shipment one hundred and fourteen head of cattle, sixty-five sheep, mainly on account of lameness or injuries received in transit. The only diseases of a contagious nature, four cases of actinomycosis

and thirty-seven cases that were suspicious of mange. Whilst I was not positive that these animals were actually affected with mange, I considered them suspicious and therefore ordered all such cases sent to the slaughter house.

In February last I received instructions from the Veterinary Director General to inspect all Canadian cattle and sheep passing through Montreal for export via Boston and Portland, 4,302 head of cattle, 994 sheep (these are included in the numbers given above), 2,103 head of cattle, 875 sheep also included above, were loaded at Quebec and Three Rivers.

I had hoped to report that the old stockyards would have been entirely reorganized or new ones built in the early part of the present season. But the railway authorities claim that owing to the amount of construction over the line they were not able to get the stockyards; but I am assured by Mr. Oborne the General Superintendent, that the plans for new yards are well under way and that new yards will be positively ready for the opening of navigation next spring and that it is the intention to have these yards covered and floored. A portion of the present yards have been in such a state owing to the mud, that I could not allow cattle in them during the latter part of the season, allowing only the floored and covered portions to be used.

I was sent for in September to see a sick heifer at Como, found the animal dying from symptomatic anthrax (black quarter). I ordered the carcass to be burned, and the field fenced off, to prevent other cattle getting in to it. This was done and no further cases have occurred.

I have the honour to be, sir,
Your obedient servant,
M. C. BAKER,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(CHAS. MCEACHRAN, D.V.S.)

MONTREAL, October 31, 1904.

SIR,—I beg to report during the year commencing November 1, 1903, and ending October 31, 1904, there were inspected, found free from disease and shipped from the port of Montreal to Great Britain, 294 head of horses. Three horses were held back, viz.: One suffering from strangles and two from influenza.

There were imported to Canada during the year via port of Montreal, 440 head of horses, viz., 266 stallions, 169 mares, 3 geldings and 2 colts.

All were inspected and allowed to go forward to their destinations.

The exportations and importations have been as follows :—

Months.	Exportation.	Rejected.	Importation.
1903.			
November	32		48
1904.			
May	65	3	19
June	67		87
July	19		2
August	27		73
September	45		52
October	39		159
Total	294	3	440

IMPORTATION.

	Stallions.	Mares.	Geldings.	Colts.	Total.
Clydesdales	197	104		2	
Shires	15	2			
English Thoroughbred	2				
Suffolk Punch	2				
Boulanaise	4				
Percheron	13	1			
Hackney	16	3			
Ponies	8	59	3		
Jackasses	9				
	266	169	3	2	440

I have the honour to be, sir,

Your obedient servant,

CHARLES McEACHRAN,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(B. A. SUGDEN, D.V.S.)

MONTREAL, October 31, 1904.

SIR,—I have the honour to report to you upon the inspections of live stock made at the Grand Trunk Stock Yards, Montreal, during the period extending from November 1, 1903, to October 31, 1904.

The monthly shipments have been as follows :—

Month.	Canadian Cattle.	U.S. Cattle.	Canadian Sheep.	U.S. Sheep.
1903.				
November	3,731	126	5,866	
1904.				
May	3,557	2,439	18	
June	6,271	2,036	859	
July	7,832	732	3,704	
August	7,639	189	1,518	
September	5,346	2,210	2,772	659
October	4,036	1,541	4,105	
	38,412	9,273	18,842	659
	9,273		659	
Total Cattle and Sheep	47,685		19,501	

In February, 1904, the inspection of Canadian cattle and sheep passing through Montreal for shipment at the port of Boston and Portland was commenced. Since that date the monthly shipments have been as follows :—

Month.	Boston.		Portland.	
	Cattle.	Sheep.	Cattle.	Sheep.
February	.....	.....	1,152	124
March	75	.....	1,279	252
April	556	.....	1,205	.....
May	529	.....	1,442	132
June	1,136	.....	2,566	3,746
July	1,370	561	2,771	3,769
August	1,656	301	2,657	2,404
September	1,298	.....	1,775	1,717
October	1,558	971	1,011	.....
Total	8,178	1,833	15,858	12,144

During the past year one hundred and nineteen cattle were rejected, thirty-one affected with actinomycosis, one tuberculosis, two blind, thirty-one mangy. The balance for sore feet or injuries received during transportation. There were fifty sheep rejected for sore feet and various injuries received during transportation.

From November, 1903, to October 31, 1904, the following United States cattle and sheep passed through Montreal for shipment at Portland and Boston :—

	Cattle.	Sheep.
Portland	18,446	29,411
Boston	7,879	1,849
	26,325	31,260

I have the honour to be, sir,

Your obedient servant,

B. A. SUGDEN,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(J. H. FRINK, V.S.)

ST. JOHN, N.B., October 31, 1904.

SIR,—I beg to submit my annual report concerning inspection of animals at this port and district.

Animals Inspected for Export.—Great Britain and South Africa : Cattle inspected, 31,072; sheep inspected, 22,750; horses, 31. Three shipments of cattle, after inspection here, were sent forward to Halifax for loading. The total number of cattle being 30,220 placed on shipboard here. All these, with the exception of one shipment by ss. 'Oriana,' went to Great Britain. Two cattle were condemned with actinomycosis, one with acute glossitis, fifty-nine cattle were condemned for lameness and injuries in

transit; two died in the yards from intestinal disorders, and fifteen sheep were also condemned for injuries; two sheep were condemned, suspicious of scab.

The Canadian Pacific stockyards were not maintained as well as they should have been after the month of February, and it became necessary for me to officially notify the railway that these must be kept in a clean and comfortable condition. This work was not done as promptly as I would have liked, and was only completed by continued urging.

Inspection of Animals—Mange : In February, information reached me, that mange on horses, existed in a public stable within the city limits, and from this source it was being distributed about the country. Examination of the subjects and inquiry into the history, left no doubt as to the diagnosis and character of the disease. Microscopic investigation by the bacteriologist at Ottawa, confirming this. This place was at once quarantined, and the horses which had escaped before my entrance were followed and quarantined, and kept under surveillance until discharged. Some animals were so badly affected that they were destroyed by the owners. The work of eradication was facilitated by the majority of the owners submitting cheerfully to quarantine restrictions. A few people endeavoured to frustrate the work of the department, but when it was made perfectly clear to them that violators would be summarily dealt with according to law, resistance ceased. Eighteen horses were found affected during the year, and nearly all were directly traced to a single centre of infection. The usual remedies were resorted to with sulphur as a base. A very efficacious remedy was found in bi-chloride of mercury soap. There does not appear at this time of writing to have been any further outbreaks in the province. The disease in question, I think, originated here from range horses brought in from the western states by the Imperial government for shipment to South Africa, but at the close of the war were sold to various parties.

Anthrax.—Information having been furnished me that several cattle had died suddenly on the farm of Joseph Stackhouse, Upper Loch Lomond, St. John county, and that contagious disease was suspected, an inspection and post-mortem examination was made, the bacillus of anthrax was easily identified on miscroscopical examination; five cattle died, the carcasses were burned and the stables cleansed and thoroughly disinfected.

Tuberculosis.—A number of cattle were subjected to the tuberculin test, belonging to Governor Snowball. These animals were found free.

Fifteen head of cattle imported from Scotland by ss. 'Lakonia' were subjected to the tuberculin test in quarantine. Six animals reacted, and one suspicious. These six were permanently ear-marked and one branded on the hoof.

TRANSPORTATION OF ANIMALS FROM GREAT BRITAIN AND HOLLAND.

1903.—Dec. 17.—Three head Berkshire swine imported by Wm. Linton, Aurora, Ont., from Scotland.

1904—February 17.—Fifty head Holstein cattle from Antwerp, ex ss. 'Montrose,' 46 cows and 4 bulls. Eighteen calves were born in quarantine. At the expiration of ninety days these were discharged, having been subjcted to the tuberculin test by the United States veterinary officer in Holland. These animals were consigned to Messrs. Ward, Mitchell, Knowles, Syracuse, N.Y. State.

March 23.—Fifteen cattle, twelve shorthorn, three polled Angus, were imported from Scotland, by Graham, Carberry, Man. These were detained, ninety and fifteen days, respectively, in quarantine and discharged.

December 7.—Seven horses imported, ex ss. 'Lakonia,' Glasgow, by D. Campbell, Alverston, Ont., and J. Graham, Carberry, Man.

February 2.—Sixteen horses imported, ex ss. 'Tritonia,' Glasgow, by Thomas Graham, Claremont, Ont.

March 23.—Twenty-one horses imported by J. Graham, Carberry, Man., ex ss. 'Lakonia,' Glasgow.

April 9.—Ten horses imported by Quebec government, ex ss. 'Montezuma,' from Rotterdam—Belgian breed.

The animals were inspected and found free from contagious and infectious disease and were allowed to proceed.

INSPECTED FROM UNITED STATES.

1903.—Two head swine, imported by R. K. Britton, Woodstock, N.B., quarantined fifteen days and discharged.

1904.—May 18.—One Guernsey bull, imported by Walter McMonagle, Sussex, N.B., from United States. being accompanied by necessary health certificates, was allowed to proceed.

I have the honour to be, sir,

Your obedient servant,

JAMES H. FRINK,

Inspector.

The Honourable

The Minister of Agriculture,

Ottawa.

(WM. JAKEMAN, D.V.S.)

HALIFAX, N.S., October 31, 1904.

SIR,—I beg leave to submit my annual report of animals inspected at port of Halifax, N.S., for one year ended October 31, 1904.

ANIMALS inspected for export at Halifax, N.S., 1903-04.

	Horses.	Cattle.	Sheep.	Swine.
1903.				
November	28	351	103	...
December	4	1	84	...
1904.				
January	21	1,779	596	4
February	2	1,154	604	...
March	15	1,134	143	...
April	2	603	142	15
May	1	784	151	3
June	1	...	10	...
July	1	...	90	1
August	8	5	20	24
September	9	4	113	3
October	72	7	160	4
	164	5,822	2,216	54

ANIMALS inspected for Import at Halifax, N.S., 1903-04.

	Horses.	Cattle.	Sheep.	Swine.
1903.				
November	4			
December	1			
1904.				
January	1			
March	1			
April	1	5		3
May	2			
September	1			
October	1			
	12	3		3

I have the honour to be, sir,
Your obedient servant,
WM. JAKEMAN,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(A. A. LECKIE, M.R.C.V.S.)

CHARLOTTETOWN, P.E.I., October 31, 1904

SIR,—I have the honour to submit my annual report of animals inspected at the port of Charlottetown, P.E.I., for the year ended October 31, 1904.

ANIMALS inspected for Export at Charlottetown, P.E.I.

	Horses.	Cattle.	Sheep.	Swine.
1903.				
November	11	20	1,935	
December		20	143	
1904.				
April	1	85	16	
May	17	238	182	
June	8	242	365	26
July	3	212	278	
August	9	46	220	
September	6	20	341	
October	4	36	1,955	9
	59	919	5,435	35

ANIMALS inspected for Import.

——	Horses.	Cattle.	Sheep.	Swine.
.. ..	4	.....	.....	.....
	4	.....	.....	.....

I have the honour to be, sir,
Your obedient servant,

A. A. LECKIE,
Inspector.

The Honourable
The Minister of Agriculture.
Ottawa.

(J. A. COUTURE, D.V.S.)

QUEBEC, P.Q., October 31, 1904.

SIR,—I have the honour to send my annual report for the twelve months ended to-day. During that period we have admitted into this quarantine station 857 animals being :—

Cattle..	286
Sheep..	370
Swine..	144
Goats..	57
Total..	857

The cattle were of the following breeds :—

Shorthorns..	100
Galloways..	81
Holsteins	41
Ayrshires..	25
Simmenthales..	18
Aberdeen Angus..	9
Brown Swiss..	8
Herefords..	2
West-Highland..	1
Kerry..	1
Total..	286

The destination of these cattle was as follows :—

Shorthorns	for Canada	99	For United States		1
Galloways	"	—	"		81
Holsteins	"	—	"		41
Simmenthales	"	—	"		18
Brown Swiss	"	—	"		8
Ayrshires	"	25	"		—
Aberdeen Angus	"	9	"		—
Herefords	"	2	"		—
West-Highland	"	1	"		—
Kerry	"	1	"		—
Total		137			149

The sheep comprised eleven breeds as follows :—

Shropshires	147
Oxfords	57
Cotswolds	55
Hampshires	40
South Downs	25
Lincolns	14
Dorsets	9
Cheviots	8
Unknown	6
Romney Marsh	5
Leicesters	4
Total	370

The destination of these sheep was as follows :—

Shropshires	for Canada	133	For United States		14
Oxfords	"	35	"		22
Cotswolds	"	47	"		8
Hampshires	"	4	"		36
South Downs	"	21	"		4
Lincolns	"	14	"		—
Dorsets	"	8	"		1
Cheviots	"	—	"		8
Unknown	"	—	"		6
Romney Marsh	"	5	"		—
Leicesters	"	4	"		—
Total		271			99

The swine belonged to the following breeds :—

Yorkshires	98
Berkshires	44
Poland China	2
Total	144

The goats belonged to the following breeds :—

Toggenburg	....	27, being 15 for Canada and 12 for United States.
Saanan		eighteen, being four for Canada and fourteen for United States.
Nubian	....	1 for Canada.
Murcia	....	2 "
Alpine	....	3 "
Maltese	....	6 "
Total	....	57

There were seven deaths—being 2 calves and 5 goats.
Five calves were born in quarantine.
There were no contagious diseases.

I have the honour to be, sir,
Your obedient servant,
J. A. COUTURE,
Superintendent.

(W. H. PETHICK, V.S.)

ANTIGONISH, N.S., October 31, 1904.

SIR,—I have the honour to inclose herewith a report dealing briefly with the work conducted at the experiment station at Antigonish during the year just ended. As the experiments now in train have not yet been extended over a sufficient length of time to warrant us in forming definite conclusions which if too hastily arrived at may later on be found incorrect and misleading, I presume that an extended report will not be expected. Detailed reports in all matters in connection with the work have from time to time been forwarded to the Veterinary Director General.

Under Dr. Rutherford's instruction, I have had the honour of conducting a number of experiments with a view of answering, if possible, the following questions :—

1. Is Pictou Cattle Disease contagious ?
(a.) By means of infected stables ?
(b.) By direct contact with diseased animals ?
2. Is this disease caused by the ingestion of Ragwort (Senecio Jacobea).
3. Does feeding (good or poor) predispose or render more or less liable to disease ?
4. Medicinal treatment of this disease.

Experiment No. 1.

To learn if this disease is contagious through the medium of infected stables, if so, does good or poor feeding render more or less liable to disease.

In this experiment sixteen young animals are employed, they are housed in an old frame stable in which thirty-six head of cattle had previously died of Pictou cattle disease, these animals are divided into lots of four and fed daily as follows :—

A—D, sufficient hay fed twice daily, 4 pounds grain mixture.
E—H, " " " 2 " "
I—Z, " " " without grain.
M—P, a restricted allowance of hay "

The hay fed in this stable is mixed clover and timothy, absolutely free from ragwort, imported from Quebec.

This experiment began November 24, 1903, and up to the present all the animals appear to be in excellent health and condition.

Experiment No. 2.

To decide whether the disease is caused by the ingestion of ragwort (Senecio Jacobea) if so, does good or poor feeding render more or less liable to disease.

In this test sixteen young animals are employed and housed in a new isolated stable and have never been in contact with the disease or exposed to contagion in any manner.

These animals are subdivided into lots of four, and fed daily as follows:—

1—4 sufficient hay containing Ragwort, 4 pounds grain mixture.
5—8 " " " 2 " "
9—12 " " " without grain.
13—16 a restricted allowance of hay containing Ragwort, without grain.

The hay feed in this test is natural grasses with a liberal mixture of ragwort.

The grain mixture consists of barley, oats and bran.

The experiment in feeding began November 24, 1903.

Animal No. 16 died of Pictou cattle disease, on July 19, 1904.
" 8 " " " " Sept. 8, "
" 11 " " " " Sept. 12 "

Experiment No. 3.

To ascertain if the feeding of 'Ragwort' (cured by itself) would produce the disease.

In this test two healthy young animals were employed. No 17 was fed twice daily on chopped Ragwort with very little bran. No. 18 was fed twice daily on chopped oat straw with very little bran.

The feeding began on November 24, 1903. No. 17 died of Pictou cattle disease on July 22, 1904; at the time of writing No. 18 appears to in good health.

Contact experiment.

To ascertain whether the disease is contagious by direct contact with animals affected with the malady.

In this test two young animals, one of which had been well fed, the other rather poorly fed during the early winter, were placed in an isolated stable and tied in the same stall with a steer which was suffering with Pictou cattle disease. These animals were fed (upon imported hay)out of the same manger and watered from the one pail, also ran together in a small pen where the manure was allowed to accumulate and later on (in the summer) the contact animals were kept in an inclosure with other animals affected with the disease. This experiment began on April 7, 1904, and was repeated on June 17, and again on July 19, the diseased animals with which those were in contact usually living about 12 days.

At this date, animals appear in good health and are in fine condition.

Treatment.

Those who are familiar with the nature of this disease (hepatic cirrhosis) will agree that a cure can hardly be expected and our only hope is to learn the cause, then advise the best means of prevention. Yet we appear to have had marked results from the use of some drugs in arresting the progress of the disease, at least for a time.

Our experiments along this line are very incomplete and it is necessary that the animals under treatment, should be under observation for a much longer time, and indeed, killed and autopsies held before any conclusion as to the value of medicinal agents can be arrived at.

Purgatives repeated occasionally and the daily administration of strychnine and iron, the former subcutaneously, together with careful feeding has certainly prolonged the life, and indeed brought into good condition three animals which have been under observation for some months. How long this condition will last, time alone can tell. The following record of a case may be of interest. You will notice that the acute symptoms disappear under the 'strychnine treatment' to return when it is suspended, but later on some more permanent improvement is observed.

Treatment of Pictou Cattle Disease.

Grade Ayrshire cow, six years old, should calve May 16, 1904, general appearance would indicate Pictou cattle disease. Temperature 100, pulse 74, quick and weak, variable appetite, diarrhœa. The owner Mr. D. McLellan, stated that this cow has been failing for some weeks.

March 16. Gave purgative, followed by strychnine and iron daily.
" 21. Improvement in appetite. Temperature 100, pulse 70.
" 30. General improvement, faeces almost normal.
April 10. General improvement, faeces quite normal.
" 16. Medicine discontinued.
" 19. Mr. McLellan reports the return of symptoms.
" 20. Slight diarrhœa, general condition rather unfavourable.
" 24. Gave fresh supply of medicine.
" 26. Again improving faeces almost normal.
May 12. Calved to-day, weak, otherwise condition favourable.
June 10. Much improvement, out at pasture.
July 10. Has gained much in flesh and appears to be in good health.

This treatment has been administered in other four cases, two of which have given very similar results, while in two cases the animals seemed to improve for a short time, acute symptoms returning, after which drugs had little or no effect in improving the condition, the animals dying of Pictou cattle disease in a few weeks.

On May 10, I had the honour of receiving instructions from the Veterinary Director General to deal with all cases of Pictou cattle disease when occurring in this county. In the discharge of this duty I have made 62 trips to different parts of the country, travelling in all about 1,200 miles, and have caused to be slaughtered 38 head of cattle, for which $384 was paid in compensation.

The enclosed chart* will give name and address of owners in each case, number of animals destroyed, sex, year of greatest mortality on each farm, number of cattle comprising each herd, and other information which may be of interest to you.

Although the loss in the county has not been as great as usual, yet I regret to state that the disease has this year claimed 'new territory,' particularly to the south this fact with the discovery of the disease in Prince Edward Island, and the probability that it exists elsewhere, has caused much public interest to be taken in the work at the experiment station.

I think that you will agree that the experiments so far conducted give promise of practical results, and I am glad to learn that it is the intention of the Veterinary Director General, who has kept a very close supervision of the work, to continue the experiments now in train, with the addition of others, over at least another year, when, I

* Not printed.

trust, more definite knowledge will be gained, and which will enable you to advise such measures as will lead to the prevention of this disease.

I have the honour to be, sir,
Your obedient servant,
W. H. PETHICK,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(GEORGE TOWNSEND, D.V.S.)

NEW GLASGOW, N.S., October 31, 1904.

SIR,—Please find a tabulated report of work during 1903-04.* You will see by my notes in report that I done the quarantine work in Antigonish and Pictou counties during November, December and January of this year; from February to the end of October only in Pictou county. In September and October of this year the indemnities are two-thirds instead of one-third, as heretofore.

I have the honour to be, sir,
Your obedient servant,
GEORGE TOWNSEND,
Inspector.

(F. S. MACDONALD, V.S.)

SOURIS, P.E.I., October 31, 1904.

SIR,—I have the honour to submit to you a summary of my work for the year ending October 31, 1904.

As it has already been shown the much-dreaded Pictou cattle disease exists in some districts in Prince Edward Island. Not being familiar with this disease and its symptoms, I was instructed by Dr. Rutherford to go to Pictou county when sent for by Doctors Townsend and Pethick for the purpose of getting all the information possible in connection with this disease. This I accordingly did.

Since August last the department has paid compensation to the owners of the cattle affected by this disease and ordered to be slaughtered by me.

The following is a statement of the number of cattle slaughtered and the amounts paid to the owners :

	Slaughtered.	Amount paid.
August	3	$20 00
September	2	18 00
October	3	50 00
		88 00

I have the honour to be, sir,
Your obedient servant,
F. S. MACDONALD,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

*Not printed.

(V. T. DAUBIGNY, M.V.)

TERREBONNE, P.Q., October 31, 1904.

Monsieur,—J'ai l'honneur de vous adresser le rapport des inspections que j'ai faites à la demande du Vétérinaire Directeur Général, du 1er novembre 1903 au 1er novembre 1904.

SERVICE DE LA QUARANTAINE.

Le 16 février 1904, chez Mr. F. G. Clark, à Stanbridge à Scott farm, pour inspecter 22 cochons, soi-disant malades ; ils étaient en bonne santé.

19 juillet 1904 au clos d'équarrissage de Saint-Laurent pour faire l'autopsie d'une jument morte du charbon, appartenant à M. Charles Descarie de Dorval, P.Q.

28 juillet 1904 visite chez ce même Charles Decarie pour séquestrer ses animaux logés sur sa ferme dudit lieu afin qu'ils soient vaccinés.

24 octobre 1904 à Rectory Hill, Mégantic, chez Mr. H. A. Dickson, pour faire l'examen d'animaux soi-disant malades, tel n'était pas les cas, du moins quant à ceux que j'ai visités; l'inspection sera peut-être continuée ultérieurement.

J'ai l'honneur d'être, monsieur le ministre,

Votre bien dévoué serviteur,

V. T. DAUBIGNY,

Inspecteur.

A l'Honorable Ministre de l'Agriculture,
Ottawa.

(JOHN D. DUCHÊNE, D.V.S.)

QUEBEC, QUE., October 31, 1904.

SIR,—I have the honour to submit to you my report for the year ending October 31, 1904.

During the year I have examined ten horses suspected to be affected with glanders and tested eight of them with mallein, of which five have reacted; one has been destroyed and four are still under treatment.

There has been an outbreak of hog cholera in the county of Quebec, but with the assistance of Dr. J. D. Whyte its spreading has been promptly checked.

I am just now investigating an outbreak of sheep-scab in the county of Yamaska, Que.

I have the honour to be, sir,

Your obedient servant,

JOHN D. DUCHENE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(J. D. WHYTE, D.V.S.)

SHERBROOKE, October 31, 1904.

SIR,—I have the honour to submit to you my report for the year ending October 31, 1904.

HOG CHOLERA.

As I had been stationed at Chatham, Ont., sometime previous to October 31, 1903, assisting Dr. M. B. Perdue in dealing with the outbreak of hog cholera in that district, I continued there until November 7, 1903. In company with Dr. J. D. Duchêne, of Quebec city, I dealt with an outbreak of hog cholera at Charlesbourg, province of Quebec.

SUSPECTED HOG CHOLERA.

Upon receiving instructions, I visited Shawinigan Falls, P.Q., where hog cholera was suspected, 125 having died, but upon investigation found the deaths due to injudicious feeding.

Being instructed, I visited the slaughter houses at Point Lévis, where hogs from Western Ontario are slaughtered and gave instructions as to cleansing and disinfection, and disposition of the refuse, and when at Point Lévis inquired into cleansing and disinfection of cars and cremation of refuse, giving instructions for the same.

GLANDERS.

During the year I have tested 123 horses with mallein, 58 of which reacted, 30 being destroyed, 3 were destroyed on clinical symptoms only, total 33, 18 being retested twice, 7 being retested three times, 4 ceased reacting on second test, making a total of horses tested, 148. A large proportion of these horses were tested within a radius of a few miles from St. Hyacinthe, P.Q., it being a trading centre. A number of cheap horses purchased in Montreal are brought there and traded, the most of the outbreaks can be traced to those horses.

TUBERCULOSIS.

During the year I have tested two head of cattle imported from the United States, at the port of Mansonville, P.Q., which passed the test. Have also tested nineteen head of cattle for export to South Africa, three of which reacted. Have tested eighty-eight head of cattle which were not for export, eight of which reacted. Total tested one hundred and nine.

MANGE.

An outbreak of mange in horses in the county of Megantic, P.Q., came under my supervision, in which eighteen farms were placed under quarantine, twenty-seven horses were involved, all recovered after proper treatment, some of them were badly diseased.

ANTHRAX.

Upon receiving instructions I visited Isle du Moine in the River St. Lawrence, parish of Ste. Anne de Sorel, P.Q., to investigate an outbreak amongst the animals at pasture on that island, about one hundred had died previous to my visit, at the begin-

ning of the outbreak. The carcasses were not buried nor any precautions taken to prevent the spread of the disease. I performed a post-mortem on a colt but was unable to obtain reliable material for the pathologist. According to the statements of the caretakers of the island, this colt did not present the same appearance after death as the other animals, not having any bloody discharges from natural openings, and rigor mortis being present. I had the carcasses properly disposed of and the disease is now stamped out. A man inoculated himself while skinning one of the animals and died in three days, his physician diagnosed his case as anthrax.

RHEUMATISM.

I visited Lambton, Beauce Co., P.Q., to investigate a supposed outbreak of a contagious disease. Upon inquiry I found that the animals had been ailing for some length of time and as some got so stiff that they were unable to rise a few of those were destroyed, the rest recovered.

Inspected at the port of Mansonville, P.Q., two buffaloes which were imported from the United States for British Columbia.

Inspected at the port of Sherbrooke, P.Q., eleven head of cattle imported from the United States for exhibition purposes.

I have the honour to be, sir,
Your obedient servant,
J. D. WHYTE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(Professor Andrew Smith, M.R.C.V.S.)

Toronto, October 31, 1904.

Sir,—I have the honour to submit the following brief report on the health of the domestic animals in the province of Ontario during the past year.

HORSES

Have been generally healthy. A few cases of glanders have occurred, which have been attended to by the inspectors and reported to the department.

CATTLE.

There have been no signs of enzootic or epizootic disease among cattle.

SWINE.

Some outbreaks of hog cholera have occurred in the western part of the province, but the disease is under control.

ANDREW SMITH, F.R.C.V.S.,
Chief Ontario Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(T. E. Watson, V.S.)

Niagara Falls, South, October 31, 1904.

Sir,—I have the honour to report that few diseases of a contagious character have appeared in this section during the past year.

Hog cholera which has in previous years prevailed to some extent seems to have been stamped out, not a single case having come under my notice this year.

The following are animals imported and quarantined where necessary, during the year, all of which were healthy :

Swine	7
Sheep	105
Cattle	5
Horses	2

I have the honour to be, sir,
Your obedient servant,
T. E. WATSON, V.S.,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(F. A. Jones, V.S.)

Windsor, Ont., October 31, 1904.

Sir,—I have the honour to submit my report of stock inspected at the Windsor quarantine station for the year ending October 31, 1904.

The swine imported were of good quality.

There have been no diseased animals in quarantine, other stock requiring inspection were in a healthy conidtion.

The following is a statement of animals received into quarantine, also stock requiring inspection.

For Export.

Cattle	11
Swine	1
Sheep	11

For Import.

Horses	18
Cattle	416
Swine	61
Sheep	240

I have the honour to be, sir,
Your obedient servant,
F. A. JONES,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(ARTHUR BROWN, V.S.)

SARNIA, Ont., October 31, 1904.

SIR,—I have the honour to submit my report of work done for the Department of Agriculture from November 1, 1903, to October 31, 1904.

In addition to performing my duties as inspector of quarantine at this port, I have slaughtered hogs, having hog cholera, on two farms in Sarnia township, and quarantined them for same, and examined a great number of stock cars, entering Canada from the United States, as to cleanliness, finding it necessary to return some of them.

The following animals have been inspected by me during the past year, the hogs having been placed in quarantine the required time.

For Import.

Cattle	54
Horses	229
Sheep	630
Swine	41
Goats	7

I found it necessary to reject eighty-five of the horses, on account of not having proper health certificates. On October 17 and 18, thirty-one hogs, returning from St. Louis Exposition, were placed in quarantine. On October 29, some of the hogs showed symptoms of hog cholera. Two days later one died. I destroyed another and held a post mortem, which confirmed my diagnosis of hog cholera, but with the free use of disinfectants and isolation, I hope to confine the disease to one herd, but at this date cannot tell how severe the attack may be.

I have the honour to be, sir,

Your obedient servant,

ARTHUR BROWN,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(M. B. PERDUE, V.S.)

CHATHAM, October 31, 1904.

SIR,—I beg to submit, herewith, my annual report for the year ending October 31, 1904.

The disease most prevalent and in fact almost the only infectious disease among animals in this district is hog cholera.

During the year 105 outbreaks occurred, involving the slaughter of 3,011 hogs. These cases were dealt with principally by Drs. Orchard, Philps and myself. The services of the local inspectors were not utilized to any extent in dealing with out-

breaks of the disease, with the exception of Dr. Rowe of Blenheim, who dealt with eighteen cases in that vicinity.

The services of Dr. Kime of Chatham, and Dr. Thorne of Wallaceburg, were chiefly confined to the inspection of shipments.

In this district, the following townships are under quarantine, Tilbury East, West and North, Raleigh, Chatham, Dover, Harwich and Walpole Island, and out of this area, the shipment of fat hogs for immediate slaughter is allowed subject to inspection.

During the year 286 cars of hogs for shipment have been inspected by the different officers operating in this district. The total number of hogs inspected for shipment being 24,143.

In January last, I was instructed by the Veterinary Director General to attend all farmers' institute meetings in this district, to discuss hog cholera and its regulations. Dr. Philps and myself attended all meetings inside the infected area, after the institute meetings were completed, I advertised and we held a number of special meetings in the different villages throughout the infected district. These meetings had an excellent effect in the way of spreading correct ideas as to the nature of hog cholera and the regulations governing it.

It is very satisfactory to note, that in the past year the outbreak was not nearly so extensive, there being 105 outbreaks, involving the slaughter of 3,011 hogs, compared with 207 outbreaks involving the slaughter of 6,543 hogs in the previous year, this being due, chiefly, to the much improved system of dealing with the disease, ordered by the Veterinary Director General.

I have the honour to be, sir,

Your obedient servant,

M. B. PERDUE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(GEO. W. ORCHARD, V.S.)

WINDSOR, October 31, 1904.

SIR,—I beg leave to submit to you my report for the year ending October 31, 1904. During the past year my work has been chiefly in the quarantined area in the counties of Kent and Essex, and consisted of dealing with outbreaks of hog cholera, inspection of shipments of live hogs and visiting farms already under quarantine, to see if they have been cleansed and disinfected in a satisfactory manner.

From November 1, 1903, to October 31, 1904, I have dealt with thirty-eight cases of hog cholera, involving the slaughter of 1,153 hogs, all of these cases but five being in the quarantined area; of these five cases four were in Essex and one in Lambton county, near Petrolea.

During the year just passed, I inspected at the various shipping points in the quarantined district, 71 cars containing 6,394 fat hogs for immediate slaughter, and consigned direct to various packing houses mostly to Hamilton and Toronto, and in a few cases to Montreal, Lévis, Quebec and Palmerston, Ont.

At the beginning of the year starting November 1, 1904, there were a great many farms, previously placed under quarantine for hog cholera; of these, I visited and in-

spected 127, and found that the cleansing and disinfecting regulations, ordered by the Department of Agriculture, had on 124 of these farms, been faithfully carried out and a recommend for their release was forwarded to the department.

I have the honour to be, sir,

Your obedient servant,

GEO. W. ORCHARD,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(M. PHILIPS, V.S.)

CHATHAM, October 31, 1904.

SIR,—I have the honour to submit herewith my annual report, from the date of my appointment, December 1, 1903, to October 31, 1904. Acting on instructions from the Veterinary Director General, on December 1, I proceeded to Chatham and worked under the direction of M. B. Perdue, and have since been dealing with hog cholera in the counties of Kent and Essex. I have had occasion to order the slaughter of 187 hogs on account of hog cholera. I have inspected 2,481 hogs for shipment at points inside the quarantined district. In addition to this, I have inspected a number of quarantined farms. For particulars, I beg to refer you to the detailed reports forwarded to your department by me from time to time on all work done by me.

I have the honour to be, sir,

Your obedient servant,

M. PHILPS,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(JOS. KIME, JR., V.S.)

CHATHAM, October 31, 1904.

SIR,—I have the honour to submit to you my report of work done by me during the past year, from November 1, 1903, to October 31, 1904.

Inspected thirteen carloads of hogs for shipment. Number of hogs inspected, 1,155. Slaughtered hogs on farm of James Doolittle, Dover township, fifty-five hogs in all.

All other reports reported to M. B. Perdue, or Dr. Orchard, V.S., officers in control of this district.

I have the honour to be, sir,

Your obedient servant,

JOS. KIME, Jr.,

Inspector.

The Honourable
The Minister of Agriculture.
Ottawa.

(W. B. Rowe, V.S.)

Blenheim, October 31, 1904

Sir,—I beg to submit herewith my annual report for the year ending October 31, 1904.

During the year, I have dealt with eighteen cases of hog cholera, involving the slaughter of 317 hogs.

I inspected forty-one cars of hogs for shipment from points inside the quarantined district. The total number of hogs shipped under my inspection being 4,633.

In addition to this work, I have inspected thirty-eight farms for the release of quarantine.

I am glad to state that no other diseases of a contagious nature has come under my notice during the year.

I have the honour to be, sir,
Your obedient servant,
W. B. ROWE,
Inspector.

The Honourable
The Minister of Agriculture.
Ottawa.

(J. R. Thorne, V.S.)

Wallaceburg, October 31, 1904.

Sir,—I have the honour to report that during the year ending October 31, 1904, I examined twenty-eight cargoes of hogs shipped from this place and that such cargoes contained 2,771 animals, all of which I found in a healthy and thrifty condition.

Hog cholera continues to appear in this district, eleven outbreaks of the disease having been reported at my office during the year, six of which were from the township of Chatham, four from the township of Dover, both in the county of Kent, and one case from the township of Sombra in the country of Lambton.

I believe that the change in the rate of compensation for contact hogs will have a most beneficial effect in that it will induce owners who suspect disease to exist in their herds to be more prompt in reporting suspected cases.

I have the honour to be, sir,
Your obedient servant,
J. R. THORNE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(WILLIAM STUBBS, V.S.)

CALEDON, ONT., October 31, 1904.

SIR,—I have the honour to submit to you my annual report for the year ending October 31, 1904.

During the year, under instructions from the department, I have tested with tuberculin, forty-nine pure-bred cattle for export, four of which reacted.

January 26, 1904. I visited Aaron township, where fatal disease among cattle had broken out.

May 16, 1904. I examined a consignment of Galloway bulls from Mr. D. McCrae of Guelph, for the Indian department, N.W.T., and found them to be in fair condition, and good individual animals.

Commencing on June 2, 1904, and ending on October 13, 1904, I regularly visited the market at Toronto every Tuesday and Thursday, also the Union Stock Yards at Toronto Junction, every Monday, and with the exception of the four animals already reported, I found the stock coming from the surrounding country into these markets, remarkably free from any kind of disease.

I paid special attention to sheep and failed to discover any signs of scab.

The cars carrying hogs from quarantined districts were all thoroughly cleaned and disinfected. In fact, I find that the railway authorities are quite anxious to have those regulations carried out.

There were no hogs re-shipped from Toronto, as they were all consigned there for immediate slaughter, and appeared to have arrived in a healthy condition.

During this time, on October 5, 1904, having been informed that black-leg broke out in Caledon, I visited the farm on lot 21, first concession, and found that two calves had adready died and one other was dying. I had the carcasses carefully removed and burned.

Also on September 29, 1904, I visited a farm near Belmont, but was unable to find any disease among the cattle in that locality.

From October 17, 1904, until October 28, 1904, I visited farms in the neighbourhood of Listowel, Myrtle, Balsam, Belmont, Delaware and Lisle, but failed to discover anything of a serious nature affecting the live stock in any of these localities. The reports of which I fully reported to the department at the time.

I have the honour to be,sir,

Your obedient servant,

WILLIAM STUBBS,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(J. H. TENNENT, V.S.)

LONDON, October 31, 1904.

SIR,—I have the honour to submit my annual report for the year ending October 31, 1904.

During the year I have tested with tuberculin sixty-eight head of pure-bred cattle owned by twenty two different breeders for export to the United States, four of which reacted and one was suspicious.

I also tested for glanders with mallein at the following places : Glencoe, three horses, not diseased; Poplar Hill, three horses, one reacted to the test also showing clinical symptoms it was destroyed and the carcass cremated, the others were placed under quarantine and after forty days retested giving no reaction. Eckfrid township, one horse did not respond to the mallein test; Lambeth, three horses gave no reaction; Canboro township, Haldimand county, two horses, one reacted, showing clinical symptoms which was destroyed and deeply buried. The other was placed under quarantine but died from other cause before the time for making the retest; Haldimand county, Darlington Road, two horses got no reaction. I visited Ripley, Huron county, and Thamesford, Middlesex county, where it was reported that a number of cattle died suddenly under peculiar circumstances after careful examination I found the disease to be of a non-contagious character and due to improper care and feeding.

Hog cholera was reported to have broken out at Arkona, Middlesex county and Wroxeter, Huron county. I visited these places and found in both cases after holding post-mortem that the animals were affected with stomach and bowel trouble due to injudicious feeding and bad hygienic surroundings. I also visited Pine River, Huron county to look over the district where hog cholera was prevalent last year. I did not find a single case showing that the disease was effectually stamped out. I visited St. Thomas, Elgin county, to ascertain whether sheep-scab had affected the flocks in that vicinity or not. After carefully examining the sheep owned by all the different breeders I had to report that the disease did not exist in that locality.

I visited the following places:—Petrolea, Sarnia, London Junction, Brantford and London to inspect and see if cars carrying hogs from the quarantined district to these places were properly cleaned and disinfected before re-shipping. I found that the railway company had neglected to attend to it. I had considerable trouble in getting the work done by the railway officials.

The health of animals in this district has generally been good. A mild epidemic of influenza occurred among horses during the fall months.

I have the honour to be, sir,
Your obedient servant,
J. H. TENNENT,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(G. W. Higginson, V.S.)

Rockland, October 31, 1904.

Sir,—I have the honour to submit this my annual report for the year ending October 31, 1904.

I have submitted to the tuberculin test, during the year, 127 head of cattle for export, of which 10 reacted. I also tested 99 other cattle, of which one reacted.

I have also dealt, during the year, with several outbreaks of glanders in Ontario and Quebec.

In June there was an outbreak of mange in the county of Prescott, in which Dr. Moore and myself had under quarantine, sixty-five farms and private institutions, the greater number of which at present have been released.

I have the honour to be sir,
Your obedient servant,
G. W. HIGGINSON,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(W. W. STORK, V.S.)

BRAMPTON, Ont., October 31, 1904.

SIR,—I have the honour to submit my report for the year ending October 31, 1904. During the past year I have regularly attended the Toronto markets which have now become distributing centres for a very large amount of live stock. I have inspected the stock, consisting of cattle, sheep and hogs ; looked after the disinfecting of numerous cars and urged the keeping of the premises in as sanitary a condition as possible.

The new market at Toronto Junction, known as the 'Union Stock Yard,' is now doing business. The facilities for handling stock and the sanitary arrangements are all that could be desired.

At the Toronto market, known as 'The Western Cattle Market,' a process of renovation has been carried on within the last few months. New and commodious pens have been erected, a large area of new flooring laid down and much attention given to the sanitary equipment.

During the year I have made numerous investigations of reported outbreaks of contagious diseases among stock and in all cases a full detailed report of these has been forwarded to your department, a synopsis of which is as follows :—

DISEASES OF HOGS.

During the winter months I visited several places in the province of Ontario where trouble amongst hogs was said to exist.

A large percentage of the trouble was among young pigs, and was nothing more or less than a form of bronchitis superinduced no doubt, by the severity of the weather. The percentage of deaths was comparatively small.

In one district, namely, that of Muskoka, I have to report the outbreak of cholera among hogs, but fortunately the epidemic did not attain anything like serious proportions.

The disease first appeared in a pen of hogs at Huntsville and from there was directly traceable to two places in the vicinity. All the hogs on these places (both ailing and in contact) were slaughtered as soon as possible after the trouble became known, the premises quarantined and disinfected and the contagion thereby gotten rid of.

GLANDERS.

During the year I have inspected some isolated cases of suspected glanders and in all cases where the disease was proven to exist, the animals were promptly destroyed and the carcasses either cremated or deeply buried in lime, contact animals were submitted to the mallein test with the result that two animals, which reacted without showing well-marked clinical symptoms of the disease, were destroyed by me.

The amendment of the Contagious Disease Act, whereby the owners will be in part compensated for the loss of an animal (reacting to mallein without showing clinical symptoms) will greatly facilitate the eradication of the malady.

CATTLE AND SHEEP.

During the year I have tested with tuberculin several consignments of cattle about to be exported.

Scab in sheep, which was somewhat troublesome in one or two counties in Western Ontario during the summer of 1903, appears to have become eradicated.

WESTERN RANCH HORSES.

I have attended several sales of western unbroken ranche horses in Toronto and vicinity, keeping a sharp lookout for mange, glanders or any other trouble which might make its appearance in this class of horses.

I have the honour to be, sir,

W. W. STORK,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(G. H. BELAIRE, V.S.)

PEMBROKE. Ont., October 31, 1904.

SIR,—I have the honour to submit to you a short summary of my work done for the year ending October 31, 1904.

During that time I have tested with mallein, eighty-eight horses, twenty-two of which reacted ; two horses that presented well marked clinical symptoms of glanders, and which reacted to the mallein test, were destroyed, one horse showing clinical symptoms of glanders was destroyed without application of the test, making in all, three horses destroyed. Of the reacting horses that did not show any clinical symptoms of glanders, I have tested twenty-two twice, six three times, and one four times, of the twenty-two that have reacted twenty have on application of 2, 3 and 4 tests finally ceased to react, and to all appearances are healthy and useful animals, all of which are branded and still under our supervision, one horse that was destroyed presenting clinical symptoms of glanders, revealed on post-mortem, well-defined glander tubercles in the lungs, and glands within and without the thorax.

I regret to say that glanders is still prevalent in this district, and this work is surrounded by a host of difficulties more particularly due to the manner in which horses are worked and handled in the lumber camps, during the winter months.

Infected horses if any, are not reported by the owners, and the result is that when a case of glanders comes under our notice we are hampered to a great extent in ascertaining the whereabouts of the origin of the disease.

I am pleased to state that with the exception of glanders, no disease of a contagious character affecting horses and other domestic animals, has come under my notice.

The method of dealing with glanders adopted by the Veterinary Director General, has proven very satisfactory to the public in general, and very instructive in demonstrating the action of mallein on glanders, its curative effects, and the different reactions obtained on different horses.

I have the honour to be, sir,

Your obedient servant,

GEO. H. BELAIRE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(CHAS. LITTLE, V.S.)

WINNIPEG, October 31, 1904.

SIR,—I have the honour to submit my annual report of inspections for the year ending October 31, 1904. The following is the number of animals imported from the United States :—

Horses	5,850
Mules	500
Cattle	4,300
Sheep	177
Swine	285

I have tested six head of pure bred cattle for export. As directed by the Veterinary Director General, I kept a strict watch on all the cattle shipped from the western ranches so as to prevent any affected with mange escaping, that might have been overlooked by the inspectors when loading, or had developed in transit. The amount shipped through to date is (32,705) and (8,136) shipped to Winnipeg for home consumption. I am pleased to state that only a very few with any appearance of mange arrived here.

There has been a good many small outbreaks of symptomatic anthrax this season, otherwise the cattle have been very healthy. There has been a good many cases of glanders in the province this season, but, very few cases of swamp fever reported.

I hove the honour to be, sir,

Your obedient servant,

CHAS. LITTLE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(F. TORRANCE, D.V.S.)

WINNIPEG, October 31, 1904.

SIR,—I have the honour to submit to you the following report on the investigation into the pathology of swamp fever in horses.

Work began on June 15, when I was able to obtain the first case, a chestnut horse purchased from a Russian residing a few miles from Winnipeg. The owner could speak very little English, so that I was unable to get a full history of the case, and only learned that he had bought the horse a few months before, and that it had been lately getting thin and weak.

The symptoms presented on examination, were characteristic of the disease—profound anaemia, weakness, emaciation, wobbling gait, unhealthy skin, pulse sixty and temperature 101·5.

The horse was placed in the laboratory stable, well fed and cared for and from day to day the blood was examined for organisms, especially with a view to the discovery of trypanosomes. In this line we made use of a method described by Dr. Coplin at a meeting of a pathological society of Philadelphia. The suspected blood is

placed in a centrifuge and the trypanosomata 'having a lower specific gravity than the red cells and a higher specific gravity than the white cells will collect in a white ring between the erythrocytes and the superimposed ring of white cells.' In addition to this we examined slides of fresh blood and also made stained films, using various methods and staining fluids to detect any intracorpuscular bodies such as the organism that causes Texas fever in cattle. I regret to report that all these observations proved negative and in none of the slides examined was anything detected which could be considered a micro-parasite. Another method tried was to draw off some blood into a sterile flask containing peptone solution, plain bouillon, or sugar bouillon. The flasks were then placed in the incubator and after variable periods of time examined and sub-cultures made from them—in every case they were found sterile.

The first horse died on August 20, and I was unable to procure any fresh cases. It was unfortunately during this period, that I had a visit from Drs. Moore of Ithaca and Kelly of Albany, N.Y., who had been in the west to examine the cases of 'maladie du coit' in quarantine. They were shown the laboratory and discussed our methods of work, but I greatly regretted that I could not show these experts a case of fever and get the benefit of their views.

The following notes of the first case, will give an idea of the course of the disease and the methods of investigation employed by Dr. Bell and myself.

Case No. 1.

June 15. A chestnut horse about eight years of age purchased from Russian Jew, June 15, by Dr. Torrance.

Emaciated, hair long and dirty, gait wobbling, mucous membranes blanched but no petechiae. Temperature 101·5, pulse 60.

June 16. Drew off an ordinary centrifuge tube full of blood from jugular. Centrifugalized it for half an hour. Drew off with a fine pipette some of the leucocytic layer and examined a number of slides for trypanosomes. Noted in several slides the inclusion of what seemed to be red blood corpuscles in leucocytes. Blood was also taken by puncturing skin and the fresh slides examined.

Blood count (Thoma-Zeiss) red blood corpuscles, 1,940,000, Haemoglobin, 20. Count of leucocytes failed, but they were apparently not increased.

June 18.—Stained prepared slips with eosin and Loeffler's methylene-blue, eosin and saturated watery methylene-blue, eosin and carbolized thionin. In some instances I thought I saw several round bodies in the red blood corpuscles. These were sometimes single, sometimes arranged in groups of four. In one slide I found a distinctly nucleated corpuscle.

June 20.—Temperature of horse keeps at about 101·2. Drew off an ordinary centrifuge tube from jugular. Centrifugalized for half an hour. Examined smears from different levels of tube, but found nothing. Also examined a number of fresh smears obtained from skin—saw the same small round bodies mentioned above, but convinced myself they were not intra-corpuscular.

June 22.—Made a large number of cover slips from blood obtained by puncturing skin.

June 23.—Temperature last evening went up to 104, but examinations of fresh blood specimens showed nothing.

June 24.—Examined a number of slides of fresh blood drawn from skin. Plan adopted was first to make a general survey of the whole field with the low power so as to detect any movement among the corpuscles such as a trypanosome would make. Then to use the one-sixth objective and ultimately the oil-immersion. Nothing could be seen in the red blood corpuscles. Numerous small non-motile bodies, about one-sixth the diameter of a red cell were seen in these preparations. They were, however,

unequal in size, and were probably debris. Some very small erythrocytes were also noted.

June 25.—Prepared a number of cover slips for staining.

June 27.—Tried to make a blood count, but the horse moved and blood got up into bulb. Haemoglobin 15. Leucocytes 5.600. Collected a centrifuge tube full of blood from the jugular and treated it as before. Examined it at all levels for trypanosomata, but found none.

June 30.—Examined fresh preparations of blood.

July 2.—Made a number of films for staining.

July 4.—Red blood corpuscles, 1,800,000, Haemglobin, 15, Oedema of dependent parts increasing.

July 6.—Examined fresh blood slides and saw an unusual number of the peculiar round bodies mentioned above. They could often be seen arranged in groups, and think they were undoubtedly debris.

July 10.—Made more films and stained.

July 19.—R.B.C., 2,980,000, Haemoglobin 20. A distinct improvement, but examination of slides was as on previous occasions, negative.

July 21.—Examined fresh preparations of blood.

July 23.—Again examined blood and made films for staining.

July 25.—R.B.C. 3,120,000, Haemoglobin 25, Leucocytes 6,000. Also examined smears.

July 27.—Made films from blood, obtained by puncturing skin. Found nothing.

July 31.—Made cultures from blood by drawing off a considerable quantity from jugular into a flask containing ordinary bouillon.

August 1.—Drew off blood in same manner into flask containing peptone water.

August 6.—Examined culture made July 31 and made sub-cultures on agar and blood serum.

August 9.—R.B.C. 2,960,000, Leucocytes 6,200. This was at time of a marked rise of temperature. Fresh specimens of blood and dried films stained with Loeffler's methylene-blue and eosin, were examined. No haematozoa or other organisms noted.

August 13.—Fresh blood slides examined.

August 17.—Sub-cultures made August 6 have remained sterile.

August 20.—Horse was found dead. Post-mortem was not performed for several hours after death, owing to unavoidable circumstances.

Two cases of swamp fever that we had the opportunity of observing this summer were practically identical in character, being both of the distinctly chronic type. Unfortunately, death occurred in each case during the night, so that an immediate autopsy was impossible and all cultures obtained from tissues were useless.

The post-mortem findings in such cases are fairly constant. The animal is emaciated, its coat is in an unhealthy condition, and there are almost always extensive abrasions of the skin. There is swelling of the dependent parts of the abdominal wall and legs, due to a sero-glatinous infiltration of the sub-cutaneous connective tissue of parts. The mucous membranes are very pale but only in a small proportion of cases do they show petechiae.

The internal organs are more or less blanched, though this is not so noticeable in the case of the liver. The lungs are generally normal in appearance. The heart is enlarged, and shows fatty degeneration of its musculature. The fat about it is often in a condition known as serous degeneration. The liver is slightly enlarged and microscopical sections show degenerative changes in the centre of lobules, with a round celled infiltration of Glisson's Capsule. These cells are of the size and character of lymphocytes. There is also a considerable deposition of iron holding pigment. The spleen is the organ most markedly affected, being much increased in size and very firm. Microscopical examination shows deposition of iron holding pigment

all through the pulp and also a peculiar proliferation of the endothelial cells of the lymph spaces.

The kidney shows little change as far as the epithelium lining the tubes is concerned, but the same infiltration of lymphocytes is to be seen, particularly about the blood vessels.

The feature that stands out above all others in this disease is the widespread destruction of red blood corpuscles. In those which remain, there is frequently considerable variation in size, but deformity and nucleated forms are only rarely met with.

There is also a decided decrease in the number of leucocytes though the relative proportion of the different varieties is not altered.

Our main efforts were directed to discovering the agent at the root of this haemolytic process. Blood slides were examined by scores and at all times, but no trypanosome or haematozoon was ever detected. What the source of this haemolytic substance is, we can at present only surmise. Possibly it may be formed in the intestinal tract, by the action of some peculiar bacteria, and absorbed into the blood stream from there.

We propose on the next opportunity to direct our attention particularly in this direction.

Attached is chart of temperature of the case cited.

I have the honour to be, sir,

Your obedient servant,

F. TORRANCE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

Name Chestnut Home Ward 190

MONTH

DAY	June 16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	July 1	2	3	4	5	6
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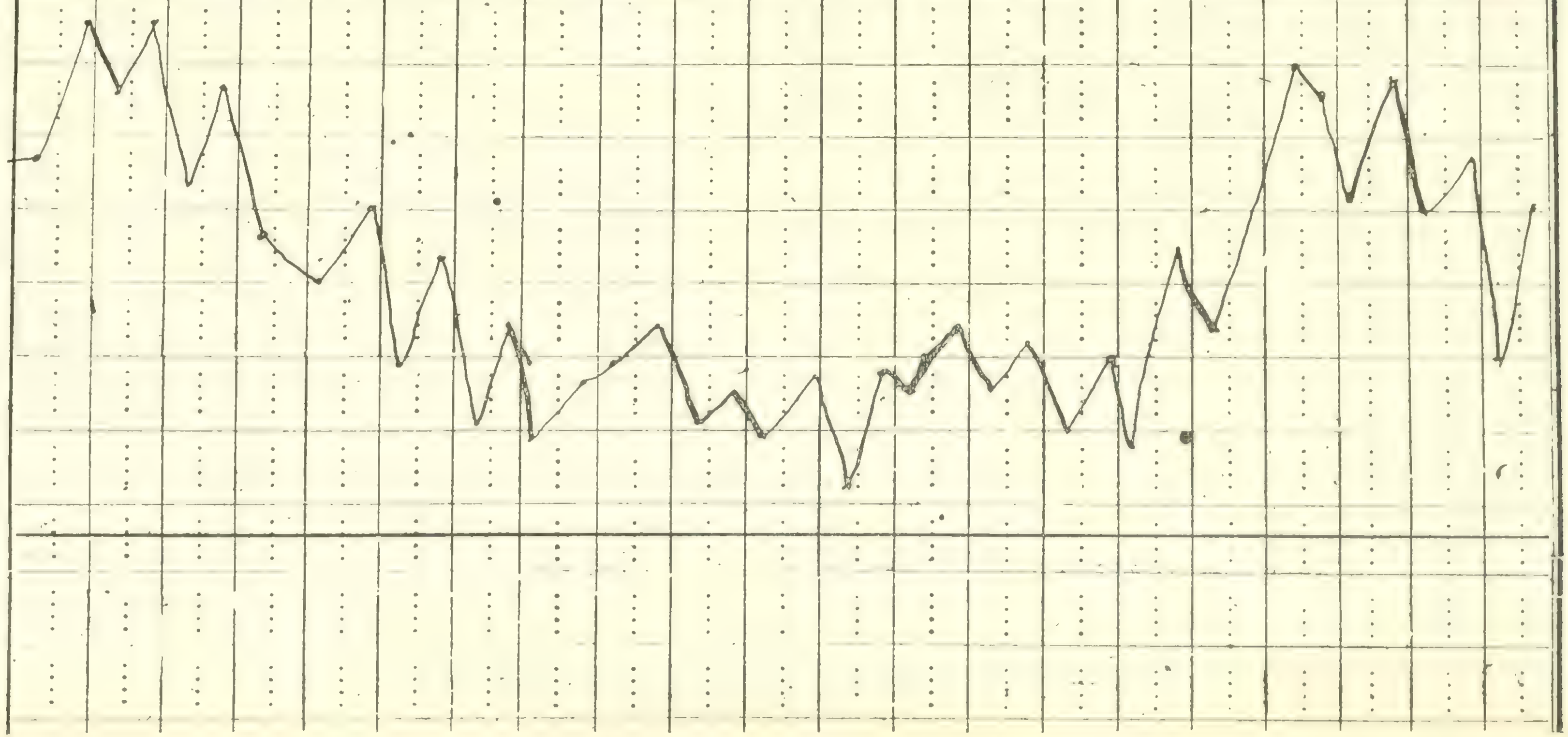
Name Chestnut Horse Ward 190

MONTH July

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Name Chestnut House Ward 190 4

MONTH July August

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TEMPERATURE CHART, ETC.

Name Chestnut Horse Ward 190 7

MONTH August

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(P. A. ROBINSON, V.S.)

EMERSON, Man., October 31, 1904.

SIR,—I beg to submit herewith my annual report of stock inspected at the ports of Emerson and Gretna for the year ending October 31, 1904. I have included separately, all range horses as this class of stock did not all pass Customs entry here, but were all subject to inspection. Apart from the importation of range horses, most of the other entries were settlers destined to various points throughout Manitoba and the Territories. Attached is a tabulated statement showing importations for each month. Not printed.

I have the honour to be, sir,
Your obedient servant,
P. A. ROBINSON.
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(M. B. ROMBOUGH, V.S.)

MORDEN, Man., October 31, 1904.

SIR,—Inclosed please find list of animals inspected at this port for the year ending November 1, 1904.

Horses	93 head.
Cattle	90 "
Swine	3 "

This stock belonged to settlers coming into Canada from the United States.

I have the honour to be, sir,
Your obedient servant,
M. B. ROMBOUGH,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(R. D. SCURFIELD, M.D.V.)

CRYSTAL CITY, Man., October 31, 1904.

SIR,—I have the honour to report on the health of the animals inspected by me in this district. The most of our entries here are settlers from North Dakota, United States, who cross the boundary here destined principally to the North-west Territories. The stock imported has been of an average quality, some very good cattle having been brought in by settlers. During the past year I have had to refuse entries of

cases of mange, principally among the breeds who enter here for the different reservations. Glanders has fortunately been rare and what cases I found were slaughtered with the consent of the owners. A few cases of actinomycosis were found, but settlers now realize the necessity of keeping healthy animals.

I am glad to report that the farmers in my district are beginning to realize the importance of the tuberculin test, having tested quite a few herds during the past year.

I have the honour to be, sir,

Your obedient servant,

R. D. SCURFIELD,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(W. LITTLE, V.S.)

BOISSEVAIN, October 31, 1904.

SIR,—I have the honour to submit the following report of animals inspected by me at Deloraine, Manitoba, and Killarney, Manitoba, during the year ending October 31, 1904.
1904.

Animals inspected at Deloraine :—

Horses	245
Mules	5
Cattle	132

Of the above, seventy-one horses were for sale, the balance of all other animals were settlers' effects.

Animals inspected at Killarney :—

Horses	343
Mules	6
Cattle	213
Sheep	1
Swine	26

Of the above animals, twenty-eight horses were for sale, the balance of all other animals were settlers' effects.

I have the honour to be, sir,

Your obedient servant,

W. LITTLE,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(W. LESLIE, V.S.)

MELITA, October 31, 1904.

SIR,—I have the honour to submit the following report of stock inspected by me at the customs port of Melita for the year ending October 31, 1904.

Horses	276
Mules	3
Cattle	81
Swine	8

Of the above 181 horses and one mule were for sale, the balance of the stock were settlers' effects.

I have the honour to be, sir,
Your obedient servant,
W. LESLIE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(J. A. STEVENSON, V.S.)

CARMAN, Man., October 31, 1904.

SIR,—I have the honour to submit to you my report of work done for the Department of Agriculture from the time of my appointment till October 31, 1904.

There has been a serious outbreak of mange amongst horses in the northern part of the county of Dufferin and at one time I had twenty-seven farms under quarantine but I am pleased to state that at the present time I have the outbreak well under control. The disease was brought into this district by a band of western horses last winter for sale.

I also had an outbreak of mange in cattle on a farm in the county of South Norfolk, but have it also under control.

There have been a few cases of glanders in this district which were handled by provincial authorities.

Black-quarter has been much less prevalent than in former years due no doubt to the more extensive use of preventive inoculation.

There is still a large number of cases of swamp fever which have been due no doubt to the unusual amount of rain this past summer.

I have the honour to be, sir,
Your obedient servant,
J. A. STEVENSON,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(A. McMillan, V.S.)

Virden, Man., October 31, 1904.

Sir,—I have the honour to report that in June last an outbreak of mange in horses was reported to me, and upon investigation discovered that it was correct. In June I established eight quarantines, five in July, four in August, one in September and one in October, making a total of nineteen. The animals have all been successfully treated with the exception of three quarantines that are remaining.

I have the honour to be, sir,

Your obedient servant,

A. McMILLAN,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(A. Bowen Perry.)

Regina, October 31, 1904.

Sir,—I have the honour to forward my annual report for the twelve months ended October 31, 1904, together with the reports of the various veterinary inspectors, which detail the work performed by them.

Mcleod District—Inspector Burnett, V.S.
Maple Creek District—S.-Sgt. Coristine, V.S.
Calgary District—S.-Sgt. McVeigh, V.S.
Prince Albert and Battleford Districts—S.-Sgt. Mountford, V.S.
Edmonton District—S.-Sgt. Sweetapple, V.S.
Lethbridge District—S.-Sgt. Gallivan, V.S.
Cardston District—S.-Sgt. Oliver, V.S.
Pendant d'Oreille District—S.-Sgt. Gray, V.S.
Coutts District—S.-Sgt. Johnstone, V.S.
North Portal District—S.-Sgt. Richards, V.S.
Regina District—S.-Sgt. Ayre, V.S.
" S.-Sgt. Mitchell, V.S
" S.-Sgt. Meakings, V.S.
Wood Mountain District—S.-Sgt. Perry, V.S.
Medicine Hat District—Dr. Hargrave, V.S.

Attached is a statement showing names of veterinary inspectors permanently employed and their present stations. Reports are forwarded from all these inspectors with the exception of S.-Sgt. White, whose report is included in that of Inspector Burnett; S.-Sgt. Busselle, who is on temporary duty in Calgary District, and S.-Sgt. Brock, who is on special duty in connection with the dipping order in the Maple Creek District. Sometimes it is found necessary to employ outside veterinary surgeons, particularly during the export season, but this is never done except when absolutely necessary.

List of Veterinary Inspectors Permanently Employed and where Stationed.

Inspector Burnett, J. F., Macleod.
Staff-Sergt. White, S. A., Macleod.
" Ayre, H. T., Regina.
" Mitchell, W., Regina.
" Meakings, E. A., Regina.
" Richards, S. C., North Portal.
" Perry, F., Wood Mountain.
" Coristine, D., Maple Creek.
" Brock, A., Maple Creek.
" Busselle, A. W., Calgary.
" McVeigh, C. H., Calgary.
" Gallivan, M. V., Lethbridge.
" Gray, F. M., Pendant d'Oreille.
" Oliver, E. C., Cardston.
" Johnstone, H. J., Coutts.
" Sweetapple, J. H., Fort Saskatchewan.
" Mountford, J. J., Prince Albert.
Dr. Hargrave, J. C., Medicine Hat.

PORTS OF ENTRY AND QUARANTINE STATIONS AT BOUNDARY.

North Portal.—Staff-Sergeant Richards, V.S., in charge. Seventeen thousand nine hundred and fifty-four cattle, 8,178 horses, 586 mules, 796 swine, and 99 sheep were inspected at this post. Twelve head of horses and 67 head of cattle were detained and quarantined, suffering from mange, they were treated, and when clean, allowed to proceed to their destinations. Entries at this station are much less than last year, particularly as regards Mexican cattle. Heavy floods and consequent blockades of the railways in spring and early summer contributed very much in lessening the number.

Wood Mountain.—Staff-Sergeant Perry, V.S., in charge. At this port 907 horses and 9 cattle were entered. None were rejected. Commodious corrals and a complete dipping plant have been constructed at this point, and though no imported cattle were dipped, all of the stock-men's cattle have been dipped in this vat, which has given great satisfaction.

Pendant d'Oreille.—This is a new station on Milk river, and has been in charge of Staff-Sergeant Gray, V.S. Two thousand two hundred and thirty cattle, 354 horses, 6,150 sheep and 7 mules were imported and inspected at this station. None were rejected. Corrals and dipping vat were constructed at this point, and are of very substantial construction and complete in detail. They are now being used to dip cattle running in that section.

Coutts.—Staff-Sergeant Johnstone, V.S., in charge at this point. Three thousand six hundred and eighty cattle, 25 mules, 33 swine and 7,482 sheep were inspected, 16 head of cattle were held as affected with mange, treated, and sent to their destination. Facilities for inspecting and treating stock are very complete, commodious corrals, squeezers, &c., and dipping vat having been constructed.

Cardston.—Staff-Sergeant Oliver, V.S., in charge. There were inspected at this point 2,278 cattle, 2,111 horses and 5 mules. The same class of corrals and dipping vat as were constructed at Pendant d'Oreille and Coutts are being built at a point south of Cardston near the boundary line where one of our detachments is to be stationed, and will be ready for use for the coming season.

There is a long stretch between Wood Mountain and Pendant d'Oreille without a quarantine station, and a site for such a station has now been chosen near the boundary line a little west of the old trail from Fort Walsh to Fort Assiniboine, Montana.

Persons bringing stock into the Cypress Hills have meanwhile been permitted to report and have their stock examined at Maple Creek.

All the corrals and dipping plants were constructed under our own direct supervision, and the work is of the most substantial and thorough description, and when the station is constructed at the point above mentioned, the system of stations will be very thorough and efficient.

At Maple Creek, a temporary station, Staff-Sergeant Coristine inspected the following imports.—209 horses, 2,645 cattle, and 1,737 sheep; and at Lethbridge and Macleod, 16 horses and 136 cattle were inspected.

The various inspectors have been very careful in carrying out the instructions contained in the Quarantine Regulations and I am certain, but very few infringements have occurred.

HORSES.

Glanders.—Glanders, I regret to report, is very prevalent in some parts of the Territories. In Regina district, which includes work done in Assiniboia as far west as Caron, 173 horses have been destroyed. In Prince Albert district 94 were destroyed, and in Calgary district 42 horses . In Maple Creek district no cases were reported, and only one suspected case in the Macleod and Lethbridge districts. In Edmonton district 18 horses were destroyed, a very marked decrease from last year. Every effort is being made to eradicate this disease. A large number of the farmers in Assiniboia turn out their horses in the winter and this has proved a fruitful source of spreading the disease, as if there is one diseased horse in the district, he is sure to come in contact with numerous horses and spread the disease. Badly ventilated and foul stables are, I believe, largely responsible for the spread of the disease. Amongst quite a large class of people, any kind of a hole appears to be good enough to keep a horse in. Particularly in district of Eastern Assiniboia, the services of several veterinary inspectors were constantly required to deal with the numerous reported cases. Some horses were tested again and again, and reacted, without showing any clinical symptoms.

By the Order in Council of September 19 last, compensation may be paid for animals reacting to the mallein test but showing no clinical symptoms. Detailed instructions and the necessary printed forms have been received from the Veterinary Director General and all horses at present in quarantine as having reacted to the mallein test will again be re-tested by two veterinary inspectors, and if reaction follows will be destroyed. Under the new regulations the work of veterinary inspectors in regard to glanders will be considerably lessened, as many horses continue to react at each successive test, and it will likely be more acceptable to the owners to have the animal destroyed at once and receive compensation, than to be obliged to isolate it for many months.

Mange.— Mange has been more prevalent amongst horses, I am sorry to say. In certain sections of the western part of the Territories it has been quite too common. Every precaution has been taken to eradicate the disease. Herds in which the disease appeared, were closely quarantined and treated, and in most instances with success but it still lingers in places. In Calgary district there are five herds still in quarantine, and in Cypress Hills, one herd. In the northern and eastern part of the Territories some cases have occured, at various points, but the inspectors state that such cases did not originate there, but occurred in horses brought from the west. It is hoped that with the treatment already given, and the compulsory dipping, that the disease may soon disappear.

Maladie du Coit. This is a new disease in the Territories, and its occurrence has created much alarm amongst horse owners in the western territories. Prompt and energetic measures have been taken for the suppression and stamping out of this disease. In the infected districts, no stallion is now allowed to run at large. About 3,000 mares have been examined and at present there are 246 confined in the quar-

antine pasture west of Lethbridge. What the disposal of these mares is to be, has not been determined at present, but a recent Order in Council authorizes animals suffering from this disease to be destroyed on an order from a veterinary inspector, and compensation on a certain scale allowed to their owners.

Inspector Burnett, V.S., has been in particular charge of this, and reports fully on it.

OTHER DISEASES.

Swamp fever and typhoid influenza, have not been so prevalent as in the past, but quite a number of settlers have suffered quite seriously.

Hoof disease, which is some years in the northern country has been very bad, has not been so serious during the past year.

The restrictions in the Quarantine Regulations, and the advanced value at which horses are now appraised, has been the means of decreasing the importation of unbroken horses of an undesirable type. One train load of Mexican ponies were imported in September and shipped to the west.

CATTLE.

Mange.—Mange is still and has been in some districts prevalent, and last winter caused considerable loss to stockmen. At a meeting of the Western Stock Association held last summer, this question was fully discussed, as it was becoming a serious matter. It was decided finally that compulsory dipping appeared to be the only remedy, and in consequence, a departmental order dated August 9, 1904, was passed, giving the boundaries of a large area of the territories this area to be an infected place, and ordering all cattle to be dipped twice at a certain interval in a certain solution between September 1, and October 31. Vats were built in various parts of the infected area, deputies were appointed by the various inspectors, to superintend the dipping, and in some sections the dipping has been virtually completed. In other sections prompt action was not taken by the stockmen, owing partly to ignorance of details, lack of energy, delay in getting the ingredients for the dip, or opposition to the measure. However, the season has been most propitious for such work and I trust to be able to report later that nearly all the stock in the infected area has been dipped. Owing to the lateness of the season when the orders for dipping were received, the work was not completed by October 31, and the returns not being in I am unable to send a report on the matter, but will forward as soon as possible.

No other disease of a contagious or infectious nature has existed in the Territories, and outside of mange, the cattle have been extremely healthy.

SHEEP.

Sheep have been very healthy throughout the Territories and no disease of a contagious or infectious nature has been reported. Importations of sheep have been small. Owing to scab and other diseases existing in the Northwestern States, care has been taken in inspecting sheep from those localities.

SWINE.

No disease has been reported as existing in the Territories. All swine imported were held at port of entry for fifteen days since the first of May last in accordance with quarantine regulations.

All thoroughbred stock imported, were tested for tuberculosis. There was only one suspected case, which is still in quarantine.

The sale of blacklegine has been small during the past year, the disease of blackleg not having, apparently, been prevalent.

The following is a statement of stock inspected for export:—

Place.	Horses.	Cattle.	Mules.	Remarks
1904.				
Maple Creek	311	4,313		21 cattle rejected for mange.
Lethbridge	404	3,350	4	Local market.
Coutts		1,917		
Calgarry	1,737	17,991		127 cattle rejected for mange.
Macleod	1,320	12,447		
Medicine Hat	1,768	7,754		112 rejected mange.
Total	5,540	47,772	4	

The following is a statement of all stock inspected for importation:—

Place.	Horses.	Cattle.	Mules.	Sheep.	Swine.	Remarks.
1904.						
Maple Creek	209	2,645		1,737		
Macleod Dist. Cardston	2,111	2,278	5			
Lethbridge	16	136				
Coutts	3,642	3,680	25	7,482	33	16 cattle rejected for mange.
P. d'Oreille	354	2,230	7	6,150		
Regina Dist. Portal	8,178	17,954	580	99	794	12 horses rejected for mange.
Wood Mountain	907	9				1 cow for Actinomycosis.
Medicine Hat	146	104				67 cattle quarantined for mange.
Total	15,563	29,036	617	15,368	827	

INSPECTION FEES.

The amount collected from November 6, 1903 to October 31, 1904, was $6,174.36, which has been duly remitted to your department.

SALE OF BLACKLEGINE.

The sum of $38.80 has, during the same period, been remitted as proceeds of sale of blacklegine distributed from here and necessary outfits for administering same.

General.—The general work of the inspectors has increased very much during the past year, and of course the compulsory dipping order has taken up almost their undivided attention since September 1, last. Owing to the great prevalence of glanders in Eastern Assiniboia, it has been difficult at times to attend promptly to all cases reported, but the best possible has been done with the means at my disposal, and very few complaints have been received. Owners of diseased stock have in nearly every instance done everything, to facilitate the work of the inspectors and are fully alive to the value of the work that is being done to stamp out disease amongst their herds.

The Veterinary Director General has been kept fully informed of the work performed under my supervision and has visited the Territories and consulted with me on various matters during the past year.

I will forward as soon as received a full report on the compulsory dipping, but I am afraid this report will be somewhat delayed.

I have the honour to be, sir,

Your obedient servant,

A. B. PERRY,

Commissioner.

(J. F. BURNETT, V.S.)

MACLEOD, October 24, 1904.

SIR,—I have the honour to submit herewith my annual report of work performed for the Department of Agriculture for the year ending October 31, 1904.

Early in the year a number of animals owned in the vicinity of Lethbridge were found to be affected with maladie du coit. An effort was made to trace the disease to its origin, but without avail. As the disease was not known to exist in the North-western States, it became a matter of speculation as to where it did originate.

Since the first case was discovered, an examination has been made of about three thousand mares, and all showing the slightest suspicion of disease have been quarantined. A stop has been put to stallions running at large, and everything done to prevent its spread.

Mange among horses got quite a start again during last winter, but the owners worked at it, and I believe so far as this district is concerned, have it stamped out.

Mange among cattle appeared to be more prevalent than usual the past season and on animals that are affected the disease is showing up worse than is ordinarily the case. Those who have dipped for mange are well pleased with the result, and a number have informed me that their cattle are looking and doing better than they did before they were put through the vat.

On October 12, eighteen horses were brought in from Cardston for shipment from this point to Calgary, to be used on the irrigation ditch. One horse presenting rather suspicious symptoms, and as the horses had been together for some time and there being no place here to isolate them, I sent them back to Cardston for Staff-Sergt. Oliver to test.

I have the honour to be, sir,

Your obedient servant,

JNO. F. BURNETT,

Inspector.

To the Officer Commanding,
R.N.W.M. Police, Macleod.

(W. MITCHELL, V.S.)

REGINA, October 31, 1904.

SIR,—I have the honour, in compliance with your instructions, to forward the following quarantine report for Depot Division for the year ending the 31st ultimo, together with a tabulated statement embodying more detailed information as to the number of cases, character of the diseases, &c., that have come under the notice of the quarantine staff. Obviously, too, the extensive scope of country over which these operations have been extended, the extent and magnitude of the work involved, coupled with the limited space at one's disposal in a report of this kind, necessarily necessitates its restriction to a mere synopsis of the work actually performed. Suffice to say that in every instance where the suspected existence of contagious diseases have been brought before the notice of the authorities, the premises in question have been visited with the least possible delay by some member of the quarantine staff, and such action taken as seemed best calculated to protect not only the interests of the individual, but the community as well.

Naturally, of the contagious diseases that have come under the notice of the officials of this department, glanders as usual, has demanded a preponderating measure of attention. Certainly the number of cases of this disease dealt with during the past season has been without a precedent in the history of this country. But on the other hand the influx of settlers of agricultural proclivities into these agricultural sections of the west, implying as it does a corresponding increase in the representation of the equine species has been on a scale equally commensurate, and doubtless to this fact is to be ascribed, to a considerable extent, the apparent increase in the prevalence of this disease. Altogether, upwards of 217 horses and mules showing in each instance well-marked clinical symptoms of glanders have been destroyed in addition to which the mallein test has been applied to upwards of 1,038 animals that have been more or less exposed to the contagion.

After glanders, next in importance as engrossing the attention of the quarantine staff, especially in the eastern and northern portions of the district, has been contagious mange among the equine species. For in addition to several somewhat serious outbreaks of this disease among domesticated horses in certain localities, stray animals from the ranching districts to the north affected with the disease whose ownership could not be established, have been ever and anon drifting into the agricultural districts to the South, and in some instances appearing at points widely separated from their legitimate ranges, to the great annoyance of the resident horse owners.

In cases of this kind, however, advantage has been taken of the provisions of the 'Mange Order,' the offending animals isolated and tested at owners expense, or failing that source of recoupment, the animals are sold as the law provides.

I have the honour to be, sir,

Your obedient servant,

W. MITCHELL,

Vet. Staff-Sergt.

The Officer Commanding,
Regina District, Regina.

(F. PERRY, V.S.)

R. N. W. M. POLICE,
WOOD MOUNTAIN, October 28, 1904.

SIR,—I have the honour to forward you the following report of work done for the Agricultural Department for the twelve months ended October 31.

Number of animals inspected :—

Horses	907
Cattle	9
Sheep	—
Swine	—

Of these, 500 were passed on free entry, 447 of these being estrays from this side of the line.

Amount of inspection fees collected and forwarded from time to time, $203.90.

The demand for 'Blacklegine' has been much less than last year.

Glanders.—I am sorry to have to record one case of glanders in the district which has been free from this disease so long. An aged stallion of Mr. J. H. Thompson's having been destroyed by me on September 8.

Mange.—This disease made its appearance for the first time amongst the cattle in this district in December last. Where it was possible to stop affected stray cattle intermixing with our herds, I practically stamped out the disease.

Number of cattle inspected and license given for removal from infected area, 601. One settler having the disease in his herd notified me of his intention not to ship.

The new regulations with regard to inspection and discriminating between range stock and well broken horses, have been rigidly adhered to and after one party had been refused admission for want of proper certificates, there was no further trouble. The diminution in the number of horses entered for duty, is due partly to the new law regarding inspection and partly to the increased value placed on mares and stallions.

I have the honour to be, sir,
Your obedient servant,
F. PERRY, V.S.,
Staff-Sergt.

To the Commanding Officer,
N.W.M. Police, Wood Mountain.

(H. T. AYRE, V.S.)

REGINA, October 31, 1904.

SIR,—I have the honour to attach herewith a report of work done by Staff-Sergeants H. T. Ayre, Busselle, Meakings and Mitchell, for the Department of Agriculture *re* quarantine between November 1, 1903 and October 31, 1904.

I have the honour to be, sir,
Your obedient servant,
H. T. AYRE,
Vet. Staff-Sergt.

The Officer Commanding
R.N.W.M. Police, Regina District.

SESSIONAL PAPER No. 15

QUARANTINE work performed by Staff-Sgts. Ayre, Busselle, Meakings and Mitchell between Nov. 1, 1903, and Oct. 31, 1904.

Tested and Quarantined.	Tested and destroyed.	Destroyed without test.	Tested and no reaction.	Examined only and not tested or quarantined.	Tested more than once and ceased to react.					
					1	2	3	4	5	Total.
412	173	44	626	476	.....	50	6	24	6	1,817

Horses quarantined for mange 158
Cattle " " 82
Cattle tested for tuberculosis 19
Cattle destroyed " 5

One at File Hills, Indian reserve and four at the experimental farm, Indian Head.

H. T. AYRE,
Vet. Staff-Sergt.

(S. C. RICHARDS, D.V.S.)

PORTAL, October 27, 1904.

SIR,—I have the honour to forward my annual report of work performed at this port of entry for the Department of Agriculture. The following stock were inspected:

Horses 8,178
Cattle 17,954
Mules 580
Sheep 99
Swine 794

The inspection fees for this year amount to $2,461.55.

The following stock were rejected :—Twelve head of horses affected with mange; one cow affected with actinomycosis; sixty-seven cattle in all were detained here on account of mange, and after being treated according to the instructions were released from quarantine and allowed to proceed to destination.

The decrease in the total number of stock in comparisen to last year is due more to falling off in the importation of Mexican cattle than to decrease in immigrant stock. The total decrease is also accounted for to a great extent by blockage of traffic on the railroad first of all due to heavy snow storms and followed by great floods, lasting for weeks during the very busiest time. As in former years the immigant stock were of good quality.

No improvements have been made in the way of accommodation for the unloading and feeding of stock, there is only one small yard here now quite inadequate for the purpose. Next spring it will be impossible to carefully inspect all the stock unless provisions are made to forestall the unloading and ample room made for feeding. It is also very essential to secure water there is none here in the yard. The restrictions

in the quarantine regulations and the charges in the appraising of horses for duty have been the means of decreasing the importation of unbroken horses—although in September one trainload of Mexican ponies were admitted.

I have the honour to be, sir,
Your obedient servant,
S. C. RICHARDS, S.S.

The Officer Commanding
N.W.M.P., Regina Dist.

(E. A. MEAKINGS, M.D.V.)

REGINA, October 31, 1904.

SIR,—I have the honour to forward the annual report on quarantine work done in the district.

Since entering the service four months ago, I have been working in this district on glanders. The cause of so much contagion is mainly due to farmers letting their horses run during the winter months, for instance, at Caron settlement, almost every case can be traced to a horse purchased at Moose Jaw during the fall and then immediately turned loose, much the same state of affiairs exists at Coventry settlement, Drinkwater, and considerable difficulty is met with in locating these animals after the round-up. However, the general public realize the seriousness of this disease, and have with a few exceptions given me much help in the execution of my duty, but I find after an animal has reacted to the mallein test two or three times, showing no clinical symptoms and being in first-class condition, the farmers as a general rule become careless with their isolated horses.

I find that the number of horses which cease to react is very small and out of that number none, of them had a very high temperature or much local swelling at the first test.

There was a very serious outbreak at a ranche at Parkbeg, out of eighty-four horses tested twenty-seven reacted, four showing clinical symptoms. I experienced considerable difficulty in obtaining the normal temperature of these animals owing to excitement.

I have not had a case of mange in this district with one exception in which the owner had successfully treated previous to my visit.

I have the honour to be, sir,
Your obedient servant,
E. A. MEAKINGS,
Vet. Staff-Sergt.

The Officer Commanding,
R.N.W.M. Police, Regina District.

(J. J. MOUNTFORD, V.S.)

PRINCE ALBERT, October 31, 1904.

SIR,—I have the honour to request that you will forward to the Commisioners Office, Regina, the attached annual quarantine report of services performed for the Department of Agriculture for the year ended October 31, 1904.

I have the honour to be, sir,
Your obedient servant,
J. J. MOUNTFORD,
Vet. Staff-Sergt.

The Officer Commanding,
'F' Division, Prince Albert.

(D. CORISTINE, V.S.)

MAPLE CREEK, October 31, 1904.

SIR,—I have the honour to submit this the annual quarantine report of this district for the year ended October 31.

With the exception of mange in cattle, no disease of a contagious or infectious nature has exhibited itself in stock in this district during the year.

This disease, however, prevailed to a far greater extent than usual, there being scarcely a bunch of cattle in the district free from it last winter and spring.

A result of the prevalence of mange last winter and spring was to convince cattlemen generally of the necessity of concerted action in rounding up and dipping their cattle as a means of prevention as well as cure, and found them in a mood to comply with the order of August 9, with very few exceptions.

Regarding compulsory treatment of cattle for mange, this order has been on the whole very satisfactorily carried out in this district, and fully ninety per cent of the cattle in this district will be satisfactorily treated by the end of the present year.

Dipping was by no means finished October 31, owing to the fact that a large number of cattlemen throughout the district were delayed in making their preparations to dip their cattle by difficulties in procuring sulphur, heating appliances, &c.

Fortunately, the weather continues favourable and a week or ten days more will see practically all the cattle in the district dipped or othrwise treated.

In a few cases ranchers are using chloro-naptholeum. I have notified them that this preparation is not recognized in the Order.

A suggestion which I wish to make in regard to treatment of cattle for mange is that hand treatment with any remedy be put out of the question altogether, for the reason that some are inclined even with one hundred or more head of cattle to say: 'I am going to treat my cattle by hand,' thereby causing a great deal of extra work in seeing that it is done and by delay, probably evading treating their cattle at all.

Again, in cases of this kind, it would take probably as many days as it would hours by dipping to do it thoroughly, and entail on the owner a much heavier expense and make it a matter of great difficulty for inspectors to see that it was properly done in

the case of a number of ranchers in different parts of the district proposing to treat their cattle in this way.

Dipping cattle in a properly constructed vat is, I believe, the cheapest, most successful and practical way of dealing with mange, and may be done simply and expediously by the ranchers, building a vat in every community where three or four thousand head of cattle can be got together within a reasonable distance.

As dipping of cattle is still going on in different parts of the district, and have not complete returns of cattle treated, I will make a special report on this subject. at an early date.

GLANDERS.

On November 1 and 2, 1903, I subjected to the mallein test four horses owned by Creswell and Day, of Rush Lake, they having been exposed to infection of glanders. There was no reaction or indication otherwise of the disease and the animals which were in quarantine were released in compliance with instructions from the Veterinary Director General, to whom report of cases and test charts had been forwarded.

MANGE IN HORSES.

A bunch of horses at Jas. McBains, Graburn, in which mange was found, was placed in quarantine by Dr. Hargrave of Medicine Hat, in November last. The supervision of these animals was handed over to me in May last. Notwithstanding repeated treatments, the disease still lingers in the bunch in one or two cases and they are still under close quarantine.

DISEASES IN SHEEP.

No disease of sheep has been reported to me during the year.

STATEMENT OF STOCK INSPECTED.

Imports.

Horses	209
Cattle	2,645
Sheep	1,737

Exports.

Cattle	2,659

Local Markets.

Cattle	1,654

Of the number of cattle presented for shipment export and local markets, I have found it necessary to reject twenty-one head on account of mange.

Local Markets.

Horses	351

The latter were inspected by myself at different periods at Medicine Hat, Dunmore and Walsh in absence of Dr. Hargrave.

Veterinary inspection fees collected on imports $411 79

I have the honour to be, sir,

Your obedient servant,

D. CORISTINE, V.S.S.

The Officer Commanding,
'A' Division, R.N.W.M. Police.

(J. C. Hargrave, D.V.S.)

Medicine Hat, October 31, 1904.

Sir,—I have the honour to submit the following report for the twelve months during October 31, 1904.

Number of cattle inspected and passed for shipment were 7,754 head and the number of horses inspected and passed for shipment 1,768 head.

Number rejected for mange, 112 ; number rejected for actinomycosis, 3.

A statement of these inspections is appended.

The number and classes of animals imported from the United States at this port of entry are here given :—

Horses	146
Mules	..
Cattle	104

One hundred and twenty-two (122) head were inspected free, being entered as settlers effects, and fees to the amount of thirty-three dollars and seventy-five cents ($33.75) collected on the balance. These figures show quite a falling off from those of last year, this is explained by the fact that on and after March 30, 1904, live stock was prohibited from entering at Medicine Hat, and with the exception of a few settlers, no stock was entered here after that date.

For the past twelve months, 550 black-leg vaccine (450 blacklegine, 100 double lymph) have been supplied, the sales amounting to fifty-seven dollars and forty cents ($57.40). The demand for vaccine during the past year was very little.

GLANDERS.

The number of horses destroyed for glanders during the past four years is as follows :—

1901	43
1902	21
1903	10
1904	11

Also number having reacted to mallein and still remaining under observation and control. Ten (10) head with the exception of one (1) horse all those destroyed and those still in quarantine were found in the Eagle Butte district and no doubt all contracted the infection from the same source. An endeavour has been made to test all the horses that have been exposed to the infection, but there is at this date still another herd that I propose testing. A statement of the horses affected with glanders is appended.

TUBERCULOSIS.

Fourteen (14) purebred Durham females for export to the United States were tested, none of which reacted.

MANGE.

Among cattle the mange last year, especially during the winter, was very prevalent, perhaps never so bad in this district, no headway seemed to be made by the hand-treatment of cattle and the compulsory dipping of all cattle was quite in order

and recognized as most beneficial by all the ranchers. Unfortunately it was left too late, and although the bulk of the dipping in this district is over, still it will not be finished before the twentieth of November.

The outbreak of mange among the horses, reported last year, assumed a very serious aspect before spring. This was no doubt due to the fact that the fall before, just as the round-up was finishing, the greater part of the range on the north side of the river was burnt, and the horses were turned loose with but very little done towards stamping out the disease. By spring about eighty per cent of the horses were affected and the loss during the winter in some of the herds amounted to at least twenty per cent. During the past summer splendid progress has been made towards stamping the disease out, and I venture to say that before winter sets in, we will have effectually cured all horses under our observation and control. No doubt a few cases remain at large, having been missed by both spring and fall round-ups.

Both psoroptic and sarcoptic mange exists among the horses, but the latter is much more prevalent. Both swimming and cage vats have been employed in dipping the horses, and every horse in the herd, whether affected or not, practically received the same treatment. To this fact, I think, can be attributed to a great extent our success.

I think we have demonstrated that the cage vat is the most satisfactory kind of vat to use in dipping horses. We have also demonstrated that two thorough applications of lime and sulphur dip (lime 10 pounds, sulphur 24 pounds, water 100 gallons) will effect a cure.

The South African official mange dip was used in a few cases, but for horses I consider it is too strong.

Good results were obtained by using as a hand application linseed oil, coal oil and sulphur, and I believe one thorough application will in most cases effect a cure.

Among the patent dips used were Little's Fluid dip, McGregor's dip, Toronto sheep dip, and chloro-naphtholeum dip, but the results were not so satisfactory, as when lime and sulphur dip was used.

The loss last year from tape-worm was very small, no doubt due to the precaution taken by the ranchers by feeding preventatives.

The loss of sheep from eating poisonous plants was also small, and nearly all shepherds were provided with permanganate of potash and alum powders.

During the summer several journeys were made to Lethbridge to assist Dr. Burnett in quarantine work at that place.

I have the honour to be, sir,

Your obedient servant,

J. C. HARGRAVE,

Inspector.

The Officer Commanding
'A' Division, R.N.W.M.P.

(M. V. GALLIVAN, V.S.)

LETHBRIDGE, ALTA., October 31, 1904.

SIR,—I have the honour to forward herewith my report of work done for the Department of Agriculture for year ending October 31, 1904. I took over the duties of veterinary staff-sergeant at this post on September 1, having been transferred from Depot division, Regina.

My report prior to above date has been compiled from records kept in orderly room.

I have been informed that a large number of cattle have been shipped from this district to points in Manitoba, Ontario and Quebec, the records of which were lost in the fire which destroyed the offices of this division on July 11. Superintendent Begin informs me that Inspector Burnett made most of the inspections which are not recorded here. Stock in general are in fair condition, and seem to be comparatively free from contagious diseases; as yet only two cases of mange have been brought to my notice. Some 17,567 head of cattle have been dipped in my district for cure and prevention of above malady. I have not as yet seen any cases of actinomycosis.

During the past year a large quarantine pasture has been fenced and now contains 281 mares suffering from maladie du coit. I have visited said pasture several times in company with the Veterinary Director General and Inspector Burnett, but am unaware of the action to be taken by the department *re* the disposal of these mares.

I have the honour to be, sir,

Your obedient servant,

M. V. GALLIVAN,

Vet. Staff-Sergt.

The Officer Commanding,
R.N.W.M. Police, Lethbridge.

(H. M. Gray, M.D.V.)

Pendant d'Oreille, October 31, 1904.

Sir,—I have the honour to submit herewith my annual report of work done for the Department of Agriculture for the year ended October 31, 1904. I was transferred here in June from Regina. Prior to that date all stock was sent to Coutts for inspection. Our dipping plant is now completed and giving entire satisfaction. Our facilities for inspecting stock are first-class as we now have a large and commodious stock yard. The settlers' stock are in first-class condition. Up to the present date very little mange showing among the cattle. This country is particularly free from contagious diseases, none having even been reported to me.

Total number of stock inspected coming into Canada at this port are as follows :—

Horses	354
Mules	7
Cattle	2,230
Sheep	6,150
Inspection Fees collected	$465.99

H. M. GRAY,

Staff-Sergt.

The Officer Commanding,
'K' Division, R.N.W.M. Police, Lethbridge.

(H. J. JOHNSTON, V.S.)

COUTTS, October 31, 1904.

SIR,—I have the honour to submit herewith my annual report of work done at this place for the Department of Agriculture for the year ended October 31, 1904.

There has been a great decrease in the number of stock coming into Canada at this port, as compared to that of last year. The quality of the stock has been very good and exceptionally free from disease only having on one occasion to reject any and those were rejected on account of mange, viz., 16 head of cattle.

The stock of the settlers in this district are in good condition and showing no signs of mange as yet, and I am pleased to state that we are free from any other contagious disease.

Our facilities for inspecting stock are much better than they were last year as we now have much larger yards.

During the year I tested with tuberculin fifty-nine head of cattle but got no reaction in any of them.

The total number of stock coming into Canada at this port is as follows:—

Horses	3,642
Mules	25
Cattle	3,680
Sheep	7,482
Swine	33

Total exports—cattle, 1,917.

Inspection fees collected, $1,452.76.

I have the honour to be, sir,
Your obedient servant,
H. J. JOHNSTON,
Vet. Staff-Sergt.

The Officer Commanding
'K' Division, R.N.W.M. Police,
Lethbridge.

(E. C. OLIVER, V.S.)

CARDSTON, ALTA., October 31, 1904.

SIR,—I have the honour to forward the annual report of work performed by me for the Department of Agriculture for the year ending October 31, 1904.

There were inspected for importation at this place :—

Cattle	2,278
Horses	2,111
Mules	5

Total amount of inspection fees collected, $894.55.

No contagious disease existed in stock of any kind with the exception of horse and cattle mange.

The past winter being mild no loss of stock occurred from exposeure to cold.

One case of suspected glanders was reported a few days ago. I examined this horse, had him isolated and will make a proper test as soon as possible.

I have the honour to be, sir,

Your obedient servant,

E. C. OLIVER, V.S.,

Vet Staff-Sergt.

The Officer Commanding
R.N.W.M. Police,
Macleod.

(C. H. McVeigh, V.S.)

Calgary, October 31, 1904.

Sir,—I have the honour to submit my annual report for the Department of Agriculture for the year ended October 31, 1904. I have to depend on the records in the office for the information herein contained.

Cattle mange was prevalent throughout this district during the winter, but has not shown up to any extent in the summer, and detection of this disease during the warm weather was difficult. The whole of my district has been under quarantine for mange for some years, and the recent government Order for compulsory dipping will be most beneficial, and will result no doubt in eradicating the disease in a year or two. I will say no more as to the results of this Order as I am rendering a separate report as soon as my returns are in.

The treatment of mange in horses has been given more attention by ranchers in general and a good deal of dipping has been done. The horses of the following owners are still under quarantine, but will be inspected shortly and no doubt released, as they have nearly all been dipped :—

Christie, W. L., High River.
McHugh Brothers, Gladys.
McDougall, W., High River.
Begg, R., Dunbow.
McLaughlin, J., High River.

Some trouble was caused by a sale of horses from W. L. Christie to Pugh, Livingstone &Hoadley. These horses were inspected before being sold and a bunch of about thirty not sold on account of mange. Pugh, Livingstone & Hoadley, turned their horses on the range and alarm was caused because they had been in contact with the disease. Veterinary Inspector Riddell, however, gathered and went over these horses twice and pronounced them clean, on the last occasion he inspected 408, one by one, in a chute.

Glanders has been found in nearly every part of the district. The attached list will show the number of horses destroyed for this disease, which curiously enough is the same as last year, viz.: forty-two. At this date there are some five or six animals awaiting re-test with mallein. I notice in the correspondence some trouble was caused by owners destroying horses for glanders and not keeping the hoof with the ER brand. I would suggest a foot note be printed on Form 48, 'Order of Veterinary Inspector as to disposal of re-acting animals,' warning owners on this point.

Every shipment of stock during the year was inspected, the numbers are as follows :—

Cattle	17,891
Horses	1,737

Monthly statement of cattle shipments is attached.

Veterinary Inspectors R. Riddell and A. Hobbs have done most of the inspection of cattle shipments during the past year. Veterinary Staff-Sergeant Nyblett and G. Jemison, V.S., were also employed in this work during a portion of the year.

I have the honour to be, sir,
Your obedient servant,
CHAS. H. McVEIGH,
Vet. Staff-Sergt.

The Officer Commanding,
R.N.W.M. Police, Calgary.

(C. H. H. Sweetapple, V.S.)

Fort Saskatchewan, October 31, 1904.

Sir,—I have the honour to request that you will forward to the Commissioner's office, Regina, the attached annual report of services performed for the Department of Agriculture for the year ended Ooctober 31, 1904.

I am pleased to be able to report that there is a marked decrease in the number of animals destroyed for glanders during the past year over the preceding twelve months and in the localities where this disease prevailed to a large extent for some time previous very few cases now appear.

Mange has been more prevalent than heretofore, but is entirely due to animals coming from the south which were previously affected. This disease has not gained any headway north of the Red Deer river. The settlers have made every effort to prevent the spread of the disease and have been most persistent in care and treatment of affected animals.

The inspection of all animals from the south now necessary, will no doubt prevent the further introduction of the disease and little difficulty will be experienced in overcoming the disease entirely in the district.

Swamp fever and typhoid influenza, which have prevailed to a considerable extent during the past few years have not been so prevalent, but still a number of settlers have suffered quite seriously.

Hoof disease or perhaps more properly cutaneous quittor, which has caused considerable trouble and loss in both horses and cattle during our very wet seasons has not proved serious the past summer and autumn.

A number of most peculiar and interesting cases are seen in such a large district and much more light is necessary in some of these diseases which appear to be peculiar to the North-west.

I must say that the great loss of horses especially, would be very much overcome if the settlers paid more attention to the sanitary condition of their outbuildings and more enlightenment is essential on this most important subject before many of the above diseases can be successfully treated.

I have the honour to be, sir,
Your obedient servant,
C. H. H. SWEETAPPLE,
Vet. Staff-Sergt.

The Officer Commanding,
R.N.W.M. Police, Fort Saskatchewan

(S. F. Tolmie, V.S.)

Victoria, B.C., October 31, 1904.

Sir,—I have the honour to submit a report from April 1, when I was appointed an inspector in the veterinary branch of your department, to date.

Under directions from the Veterinary Director General, I commenced my official duties by making a thorough inspection of all the ports of entry for live stock on the boundary line between British Columbia and the States of Montana, Idaho and Washington.

Beginning at Victoria and Nanaimo, on Vancouver Island, I proceeded from there to Vancouver, New Westminster and Douglas, on the lower mainland; from there I went to Greenwood, Grand Forks and their sub-ports of Sidley, Midway, Carson and Cascade; from there to Nelson and Rossland and their sub-ports Waneta and Paterson; from there I went to Rykerts, on the Idaho line; then to Cranbrook and Elko, B.C.; and then to Gateway, on the Montana boundary.

I submitted a full report to the Veterinary Director General regarding the points visited, describing the conditions existing as I found them, with relation to their suitability for live stock ports of entry, condition of stock corrals, and the manner in which the work of the department was being carried out, and suggested certain changes which I considered would be conducive to the improvement of the service.

I also made a report on suitable sites for the erection of government quarantine corrals at the most suitable of the above points.

According to instructions from the Veterinary Director General, I made an inspection of the C.P.R. stock corrals at Revelstoke, B.C., and found them in an unsatisfactory condition. I interviewed the divisional superintendent of the C.P.R. at that point regarding them. I was informed by him that the company contemplated making an improvement in their accommodation for live stock at this point. Subsequently, on again looking into the matter, I found large and convenient corrals under construction.

I found the corrals at Nelson inadequate for the accommodation of large shipments of stock, and at Grand Forks no corrals at all. I interviewed the C.P.R. officials, drawing their attention to these conditions, since then the corral at Nelson has been enlarged and new yards erected at Grand Forks.

Hog cholera has caused some loss to swine breeders during the past summer. This disease has appeared in Victoria, Saanich, Oyster, Bright, Cranberry, Cedar, Mountain and Comox districts, on Vancouver Island, and in West Kootenay and Boundary districts on the mainland. As is usual in such outbreaks, a number of swine owners in the early stages showed a tendency to conceal the presence of the disease, with the result that several farms would be affected in a district before it was discovered by the inspector.

The disease was also spread in some districts by the practice prevailing of allowing the swine to run at large, these districts being heavily wooded made inspection a somewhat difficult matter.

However, I applied to the provincial government, informing them of the existing conditions, and requested them to strictly enforce their statute *re* hogs running at large. They responded very promptly and detailed a police officer to enforce the Act, with the result that the disease was soon got under control. Towards the end of the outbreak, when the farmers began to realize the serious nature of the disease, I found them more willing to report the appearance of it, and to take an active interest in its suppression.

I have reported heretofore on all cases of hog cholera dealt with by me.

Isolated cases of glanders have appeared in Victoria, Highland and Boundary districts. They were dealt with according to the regulations.

One small flock of sheep was quarantined for scab. I am informed that the disease was imported from Washington, U.S., before the present stringent inspection regulations for sheep were put into force.

I have tested two pure-bred shorthorn bulls with tuberculin for export to the United States, one reacted and was destroyed by the instructions of the owner, the other was suspicious and has been quarantined for three months and will be tested again at the expiration of that period.

Symptomatic anthrax appears occasionally in some districts. Tuberculosis and actinomycosis are encountered occasionally, being more prevalent in some districts than in others, they are dealt with by the provincial authorities.

Specific ophthalmia affected range and other cattle in the Okanagan valley during the summer months but subsided as the cooler fall weather approached.

In accordance with instruction from the Veterinary Director General I met him at Cranbrook, B.C., on September 21, and visited a number of the most important ports of entry for live stock on the boundary with a view to the selection of sites for the erection of government quarantine stations for live stock. The ground covered extended from Cranbrook to Victoria, B.C.

The contemplated plans for the erection of proper quarantine stations for live stock at certain points on the southern boundary of the province, and other suggested changes when carried out will place the health of animals branch of the department in this province in a much more satisfactory condition, and will greatly facilitate the work of the officers.

I have the honour to be, sir,
Your obedient servant,

S. F. TOLMIE,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(W. S. Bell, V.S.)

Cranbrook, October 31, 1904.

Sir,—I beg to submit the following report of inspection of live stock at the ports Gateway, Rykerts and Cranbrook and am pleased to say that I have had no outbreak of contagious disease of any kind in my district during the past year.

During the year 993 horses, 547 cattle, 4 mules, 39 swine passed the different ports in my district for inspection.

The new regulations requiring a certificate of health from the district from which range horses are being shipped from United States has had a good effect, also by excluding the poorer class of mares and stallions.

I have the honour to be, sir,
Your obedient servant,

W. S. BELL,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(SEYMOUR HADWEN, D.V.S.)

NELSON, October 31, 1904.

SIR,—I have the honour to submit to you my report from June 15 to October 31, 1904. During this period, there was an outbreak of hog cholera at Enterprise, Slocan Lake, which I attended to.

I also tested eleven cows imported for milk production, one of which reacted to the test.

The following list shows the number of animals inspected at this port and at Rossland.

Horses	404
Mules	2
Cattle	256
Sheep	3,670
Swine	71
Total	4,403

I have the honour to be, sir,
Your obedient servant,
SEYMOUR HADWEN,
Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(C. H. HENDERSON, D.V.S.)

GREENWOOD, B.C., October 31, 1904.

SIR,—I have the honour to submit this my report for the year ending October 31, 1904, at ports of Grand Forks and Midway.

During the year there was an outbreak of hog cholera at Greenwood and eighty-one hogs were destroyed.

One horse was tested for glanders on Anarchist Mountain and destroyed.

Eleven head of horses were refused entry at Midway, two being affected with glanders and the rest being in contact.

Following are the animals imported from April 1 to October 31, 1904 :—

Horses	712
Cattle	540
Sheep	13,040
Swine	64
Mules	9

I have the honour to be, sir,
Your obedient servant,
C. M. HENDERSON,
Inspector.

The Minister of Agriculture,
Ottawa.

(J. W. Bland, V.S.)

Vancouver, October 31, 1904.

Sir,—I have the honour to report that the general health of horses, cattle and sheep in the province of British Columbia during the past year has been good, with few exceptions.

On April 26 I inspected twenty-seven head of American Merino sheep for Clark Bros., of Addison, Vt., U.S.A., valued at twenty-five thousand dollars,—a magnificent flock indeed. Clark Bros. had five new wooden crates built here for their ocean voyage to Sydney, New South Wales. Clark Bros. and myself removing them from palace horse car number 58953, Canadian Pacific Railway Company, to new wooden crates with greatest possible care.

On April 28 I inspected thirty-four head of American Merino sheep for Bissell & Jackson, of East Shoreham, Vt., U.S.A., valued at thirty thousand dollars. Mr. Jackson had seven new wooden crates built here for their ocean voyage to Sydney, N.S.W. Mr. Jackson and myself removing them from palace horse car number 58958, Canadian Pacific Railway Company to new wooden crates with greatest possible care.

In conclusion I have again to thank the officers of His Majesty's Customs and also the Canadian Pacific Railway officers for assistance in fumigating cars from mange district.

I have the honour to be, sir,

Your obedient servant,

J. W. BLAND,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

(C. R. Richards, M.D.C.)

Victoria, October 31, 1904.

Sir,—I beg to submit herewith my report of the work carried on during the year ending October 31, 1904.

There has been a total import inspection at this port of 221 horses, 1 mule, 98 cattle and 5 swine, since May 1, 1904, when inspection was placed on mutton sheep. I have inspected 14,046 sheep.

The exportations number, 8 horses and 1 sheep.

All animals inspected at the port of entry have been free from disease.

During the year I have been called to different parts of Vancouver Island to deal with outbreaks of hog cholera, the disease first being reported from the Comox district and is supposed to have originated in swine imported from the territories; in all I have caused to be slaughtered 342 as being infected, and 59 as contact. No fresh cases have been reported for the last six weeks and I think the worst of it is now over, although for some time to come we may expect isolated outbreaks.

Considerable difficulty has been experienced in handling the disease in Chinese piggeries, which are usually kept in a very unsanitary condition. In not one instance have the Chinese reported the disease, although on investigation it was shown to have existed on their premises for some time.

In December, 1903, a case of glanders came under my notice in my private practice. I at once reported the case to Dr. Hopkins of Vancouver, B.C., who was then in charge of the work for British Columbia, and afterwards assisted him in testing the contact animals, two of which reacted and were quarantined, one passed the second test and the other was afterwards killed on showing clinical symptoms. I have since inspected and caused to be destroyed three horses infected with glanders and showing clinical symptoms, and tested with mallein two contact horses which showed no reaction.

I have the honour to be, sir,

Your obedient servant,

C. R. RICHARDS,

Inspector.

The Honourable
The Minister of Agriculture,
Ottawa.

ACTINOBACILLOSIS.

(By Chas. H. Higgins, B.S., D.V.S.)

(Pathologist.)

The possibility of this disease existing in Canada was first mentioned by the Veterinary Director General of the Department of Agriculture, Dr. J. G. Rutherford, in his annual report for 1902.[1] The confirmation of this suspicion was made by the writer in an official report dated June 23, 1905, and since that time three other identified cases have been studied and have also furnished the data upon which this Bulletin is based.

The non-identification of this disease in the past has been due to the fact that little or no original work has been conducted in Canada, on the infectious diseases of animals, and when such work has been accomplished the greatest difficulties have been encountered.

This disease, as the name implies, bears a similarity to the disease known as 'Actinomycosis' or 'Lumpy Jaw'; and in fact a study of its anatomical manifestations and pathological lesions would lead the uninitiated to believe they were dealing with that classic affection. Until 1900-01, the two diseases were considered identical, in fact no effort had been made to differentiate between them until it was shown by Lignières and Spitz[2] that two distinct diseases were being treated under the one name, 'Actinomycosis.' Their work was exhaustive and indicated that beside the streptothrix causing the classic Actinomycosis, a bacillus, having none of the characteristics of a dichotomous strepthothrix was responsible for lesions exhibiting the same general character as are found in Actinomycosis, with the exception of their microchemical reactions, and, from its bacillary causative agent named it 'Actinobacillosis' (which means a ray-forming baccillus).

Nocard,[3] in 1902, identified this affecton in France, showing also that its distribution was general in that country.

The disease studied by us is identical with that studied by Lignières and Spitz in the Argentine Republic, and M. Nocard in France, with the exception that the bacillus isolated from our cases has not in any instance shown the degree of virulence credited to that isolated by the investigators mentioned, hence we may safely assume that in the cases studied, we have been dealing with an attenuated form of the disease.

The history and extent of this affection in Canada has not been fully ascertained, but it is more than probable that a number of the cases known under the name of Actinomycosis, would, if investigated, be found to be due to the peculiar bacillus which we are about to describe.

It is not our purpose at this time to discuss the subject of Actinomycosis, as this disease has received consideration by various writers and we are not prepared to add any new scientific data to that already published on this affection. It is, however, our intention to present in a clear and concise manner the results of our investigations upon this newly described disease, 'Actinobacillosis,' that Canadian veterin-

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[1] Annual report of the Minister of Agriculture, 1902, p. 82.

[2] J. Lignières and G. Spitz, de L'Institut National Bactériologie Buenos Aires, Actinobacillose, Recueil de Médecin Vétérinaire, 1903.

[3] Nocard, Actinobacillose der zunge, Jhar. der Vet. Med. Berlin, LVI., Bd., p. 695, 1903 (Abstract).

arians and stock-owners may know the essential characteristics of this disease which has been identified in Canada.

The history of the four cases identified by us is very brief and will be given in as full a manner as the data accompanying the material forwarded allows.

Case I.—An aged grade cow. Suffered considerably in fall of 1901 and spring of 1902. After being allowed to run to pasture for a time and delivered of her calf she seemed to make a good recovery. This year (1903) the symptoms returned in a more aggravated form and the animal was destroyed. The affected portion, consisting of the pharynx, larynx and the upper part of the trachea, including the œsophagus and tumour mass, was forwarded to the laboratory.

The material on arrival was looked upon as a tumour of non-infectious character and was immediately placed in a solution of formaldehyde until the pressure of routine would allow its examination, which was a few days later. On section the characteristic semi-fluid glue-like pus was revealed which is almost diagnostic. It was only at this time that the exact nature of the affection was suspected and this too late to obtain positive results from animal inoculation on account of the time the material had remained in the preserving fluid. Microscopic preparations of the pus revealed the peculiar clubs, and no portion of the smear preparation retained the colouring matter when treated by the method of Gram. Sections of the tumour cut in paraffine exhibited the same micro-chemical characteristics.

Case II.—This animal was a pure bred Shorthorn bull. He was examined by the local veterinarian in May. He has what was diagnosed as a small abscess in the left parotid gland. Potassium iodide was prescribed and continued for a long period, nevertheless, the abscess increased in size, the animal continued losing in flesh and breathed with some difficulty, due to the pressure on the larynx of the tumour mass. Later another abscess appeared on the hip near the tail. Owing to the condition of the animal and the progress the disease was making he was destroyed.

The material forwarded to the laboratory in this instance consisted of pus, taken at the time of opening the abscess in the region of the parotid gland. Laboratory animals (guinea-pigs and rabbits) were immediately inoculated. The first animal to succumb to the effects of the inoculation was a guinea-pig, death occurring on the nineteenth day after intra-peritoneal injection of the pus. At the autopsy this animal exhibited the characteristic lesions of the disease from which the bacillus was obtained in pure cultures.

Case III.—In this case the veterinarian was called to see the animal and owing to the extremely emaciated condition of the subject she was destroyed. It was noted that the tongue was not normal, in consequence of which it was removed and forwarded to the laboratory.

Arrving in a fresh condition, animal inoculations were made subcutaneously, the first succumbing to the effects of the disease at the end of twenty-six days. The lesions at the autopsy were characteristic of the disease, and the bacillus was obtained from them in pure culture.

Case IV.—A growth appeared on the jaw of an animal which was being fattened for beef. This growth was supposed to have resulted from the kick of a horse. A portion of the mass was forwarded to the laboratory for examination.

On microscopical examination the lesions of Actinobacillosis were found, there being no filaments and no portion of the material retained the colouring matter when treated by the method of Gram.

Lesions.—The gross lesions seen in an infected animal are very similar to those of Actinomycosis, consisting principally of a fibrous tissue hyperplasia. In many

instances the lesions can only be differentiated from those of Actinomycosis by their reaction to the various colouring matters used in preparing the material for microscopic examination, particularly to the method of Gram, decolourizing when treated with alcohol. The pus is characteristic, of a semi-solid consistency, glutinous, almost transparent and containing whitish granules which are scarcely visible to the naked eye. These granules when examined under the microscope exhibit 'bizarre' forms, which under high magnification show the peculiar bulb-like processes radiating from the mass. Owing to the glutinous nature of the pus it is with difficulty drawn into the ordinary laboratory pipettes, which must be of large calibre. If successfully drawn into them, greater difficulty is experienced in removing it in the process of making cover-slip perparations, cultures or animal inoculatons.

Cultural Characteristics.—Cultures are obtained direct from the pus with some difficulty, it being first necessary to crush the granular masses. It has been our practice to crush these particles against the side of the test-tube, using a heavy platinum wire for the purpose.

Morphology.—The bacillus causing Actinobacillosis resembles in a marked degree the bacillus of Fowl Cholera[4] studied by the writer in 1896. It is aerobic, facultative anaerobic, non-motile and in sizes varies, usually being from 1·0-1·8 μ long and 0·4-0·6 broad. A distinct polar arrangement of the protoplasm is noted in the hanging drop preparation. It stains with the ordinary aniline dyes, particularly those which are acidulated ; but does not retain the colouring matter when treated by the method of Gram.

Broth.—Culture in beef broth[5] show a slight colouring of the medium in twenty-four hours at 37°C. This cloudiness increases and after some days a slight sediment is noted. No scum has appeared on the surface of the medium. The addition of glycerine, up to five per cent, does not influence the growth.

Gelatin.—Only occasionally has it been possible to obtain any growth in gelatin, and even this has been very slight, appearing as very fine points, visible only on magnification. These points may appear deep in the medium, along the line of stab or near the surface. No liquifaction of this medium has been observed.

Agar.—Upon agar, small translucent coloniés of one millimetre in diameter are noted at the end of twenty-four hours. The edges of these colonies are granular. In stab cultures growth is observed in the depth of the medium as well as on the surface. Colonies deep in the medium along the line of stab are finely granular and do not extend into the surrounding medium.

Gas Production.—No formation of gas has been noted in saccharose, glucose or lactose broth. There is a clouding of these media.

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[4] C. H. Higgins, Notes upon an Epidemic of Fowl Cholera, Jour. Expt. Med. Vol. III, No. 6, 1898.

[5] Preparation of broth :—

Leibig's extract of beef. . . .	5·
Sodium chloride.	10·
Witte's peptone.	5·
Distilled water.	1000·

This is boiled one hour, neutralized with potassium hydrate using phenolpthalein as an indicator and again boiled for thirty minutes and filtered. In neutralizing the medium is left slightly alkaline to compensate for the change which takes place in sterilizing in the autoclave. This broth was the basis of gelatine and agar media.

Milk.—Milk to which litmus and lactose have been added exhibits no change in reaction, nor is there a coagulation of the medium. This medium furnishes conditions favourable to the development of this organism.

Serum.—In liquid serum a floculent growth is observed in from twenty-four to forty-eight hours, which falls to the bottom of the tube. No general turbidity of this medium is observed.

Potato.—Upon alkaline potato a slight growth is noted after four days, appearing as small white colonies on the medium. Potatoes which are acid present no growth even after prolonged incubation.

Egg media.[6]—It was with egg media that the greater portion of our investigations with this disease were carried out, and it was the only medium used in the isolation of the bacillus. In the process of isolating the germ from the affected tissue of an experimental animal, the precautions noted by Theobald Smith for the isolation of the tubercle bacillus were observed. A portion of the tissue taken under such precautions was placed in the tube, partially crushed with a heavy platinum wire and smeared over the surface of the medium. A growth may appear in three days, but was in some instances not observed previous to eighteen days' incubation at 37°C. The first colonies appear as very small white dots raised from the surrounding medium, and in growing, form a mass which has the appearance of half a sphere, never attaining a diameter greater than two millimetres after prolonged incubation. If these first colonies are touched with the platinum wire, they are found to be rather hard and firmly adherent to the underlying medium, but if a smear preparation is made, the characteristic bacilli are found. If streaks on the medium are made from these first colonies, either in the same tube or transfers, observation after twenty-four hours reveals many small colonies, none exceeding one millimetre in diameter. After prolonged incubation the colonies grow very little larger, but become more numerous, gradually filling the intervening space, and finally form a white streak on the medium.

Indol.—A trace of indol is present in old broth cultures.

Agglutination.—Serum of experimental animals affected with Actinobacillosis causes a clumping of the bacilli in the hanging drop preparation, while that of other animals not infected causes no agglutination reaction.

Vitality.—The bacillus is destroyed in ten minutes at 62°C. Growths are obtained only at incubator temperature (37°C.), but may occasionally be obtained in a very slight degree at room temperature (20°C.). Tissue kept frozen for seven days, during which time the temperature ranged from —0° F. to —20° F., proved fatal to guinea-pigs on subcutaneous inoculation, in 25, 28 and 45 days respectively.

ANIMAL INOCULATIONS.

Guinea-Pigs.—Guinea-pigs inoculated intra-peritoneally with pure cultures or pus die in from nineteen to thirty-one days of a generalized actinobacillosis. We have been unable to produce death in a shorter period with a general peritonitis, which fact indicates, as already stated, that we are dealing with an attenuated virus.

The lesions presented at the autopsy are characteristic and very interesting, being entirely different from those observed, the result of other infective agents. Small pearly-white nodules appear just beneath the peritoneal and plural membranes, vary-

[6] M. Dorset. The use of Eggs as a Medium for the Cultivation of the Bacillus Tuberculosis. Annual report of the Bureau of Animal Industry, United States, 1901, p. 574.

ing from 1·0—5·0 mm. in diameter. The liver presents lesions throughout its substance, the surface being mottled. The spleen shows, usually, a varying number of nodules. The great mesenteric fold of the omentum has in every instance been the seat of extensive lesions, and in some cases has a thickness of one and one-half centimetres and a length of eight centimetres. The kidneys present nodules beneath their serous covering, but none have been observed in the substance of the organ. The diaphragm may contain numerous nodules beneath its serous surfaces. The stomach and intestines usually present nodules on their serous surfaces, varying from 1·0 mm. to 0:5 c.m. in diameter. Ulcers are usually present on the mucous surface of the stomach varying in size from 3·0 to 5·0 mm. in diameter. Ulcers were also noted in the intestine, particularly in the cæcum and large intestine. The lungs present greater or less involvement of their structure ; in some instances there being a few superficial nodules, while in others the lesions are general throughout the tissue of these organs. Serous fluid has been present in both the thoracic and abdominal cavities, but is not contantly found in either. Nodules have been observed on the surface of the heart and in the pericardial membrane. An excessive amount of fluid may or may not be present in the pericardial sac. No lesions of the endocardium have been observed. At the point where the needle enters the pertitioneal cavity there is always an extensive nodular manifestation in the abdominal wall beneath the peritoneum. The various lymph glands are usually enlarged, and present lesions.

Subcutaneous inoculation is usually followed by the same general lesions above mentioned. There is usually an abscess formed at the point of inoculation, and the lymph glands in the immediate neighbourhood are greatly enlarged. There may be no generalized infection where this method of inoculation is practised, death being due to toxic poisoning. This method of inoculation requires a somewhat longer period to result fatally, usually being from twenty-five to thirty-eight days.

Rabbits.—Rabbits, inoculated intra-peritoneally, present lesions very similar to those seen in guinea-pigs. There is a generalized actinobacillosis, in which the thoracic and abdominal viscera are involved to a greater or less extent. There is usually ulceration of the intestinal tract, more particularly of the cæcum and large intestine. in one instance this was very extensive. The serous membranes of the thoracic and abdominal cavities are extensively invilved. Inoculated intra-peritioneallly with either pure cultures or pus, rabbits die in from fifty-one to seventy days. In one instance one hundred cubic centimetres of fluid was contained in the abdominal cavity and in this fluid the characteristic tuft formation was demonstrated on microscopic examination.

We have not studied the virulence of this germ for other animals at this laboratory.

Microscopic examination.—The microscopic examination of the pus and tissues from animals affected with Actinobacillosis requires special technique to differentiate their various characteristics. The best results are obtained by the use of eosin and methylene-blue, and the method described by Lignières and Spitz[7] has given excellent

[7] Lignières and Spitz. Actinobacillose, Recueil de Médecin Vétérinaire, September 30th, 1902. Their Method is as follows :

Eosin, watery solution (Hoechst). . .	1 part
Borrel's Blue.	1 part
Water.	8 parts

Mix just before use and filter rapidly. Suspend sections attached to slides or coverslip preparations upside down over the staining dish and allow the stain to saturate them from below, thus avoiding the precipitate which is formed in the staining material. Stain in this solution for thirty minutes. Wash thoroughly in water. Use 10 per cent solution of tannic acid, which will cause colour of the section to brighten. Wash again in water. Dehydrate in alcohol. Clear with oil of caryophyllae and mountain xylol balsam. The stain, as above prepared, spoils within an hour and almost completely loses its staining qualities.

results with both the smear preparations from pus and paraffine sections of affected tissue. The methods of Gram and Wiegert also give good microscopic preparations. A saturated solution of eosin may be used, followed by Unna's alkaline methylene-blue. Good microscopic preparations of the pus may be obtained by the use of Romanowsky's stain as modified by Dutton and Todd.[8]

In fresh pus the tufts are not easily distingished, but when squeezed between the slide and coverglass are clearly visible, even to the naked eye. They are of a whitish-gray colour, and may be more easily examined if a little picro-carmine glycerine is placed at the edge of the coverslip, as the tufts stain yellow with pieric acid and the rest of the field will assume a reddish tinge.

Lesions in the various organs and tissues exhibit the same general characters as are exhibited by the tufts in the pus. The peculiar bulb-like processes are seen to extend toward the surrounding tissue, similarly as is the case in actinomycosis. Immediately surrounding the mass of the lesion is an inflammatory area, its extent depending upon the nature of the lesion.

Infectiousness.—Actinobacillosis is an infectious disease, capable of communication by direct inoculation. We are not prepared at the present time to indicate the degree of danger through co-habitation, but from the nature of the infective agent we believe that this danger is perhaps slightly greater than is the case with actinomycosis. We have not found in any of the material indication of grains.

Treatment.—In this bulletin on the subject of Actinobacillosis it is fitting that something be said concerning the treatment of affected animals. We have conducted no experiments with this end in view, although we have such under consideration, but we have the results of other workers, who indicate treatment similar to that which is pursued in cases of actinomycosis, consisting principally in the administration of large doses of potassium iodide. This treatment, while beneficial, will have no ultimate results unless prescribed in the manifestation of the affection.

From the fact that in the majority of cases the lesions are located in the region of the larynx, and from the extensive tumour formation respiration is seriously interfered with, it is easily understood why the treatment must be commenced early. If the disease process has extended too far, the condition of the animal is such as to make treatment an unprofitable investment, for we have beside the actual lesions, the toxine poisoning to deal with.

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[8] Dutton and Todd. Trypanosomiasis Expedition to Senegambia, Liverpool School of Tropical Medicine, 1902, p. 3. Modification of Romanowsky's stain.

Solution A. Medicinal methylene blue (Hoechst)....	0·5	Grammes
Saturated solution of chemically pure borax....	0·5	c. c.
Incubate four days at 37° C., then add absolute alcohol....	50·	c. c.
Solution B. Eosin, Extra B.A. Crystals (Hoechst)....	25·0	Grammes
Distilled water....	50·	c. c.
Absolute alcohol....	50·0	c. c.

For use dilute with water, one part of stain to nineteen parts of water. Mix equal parts of diluted stain in a flask and pour immediately into a staining dish. Stain three to six minutes. Wash quickly but throughly in tap waper and try in the air without the aid of heat.

MANGE.

The term scabies or mange is applied to a class of skin disease produced by parasites of minute size belonging to the natural family *Sarcoptidæ*, which comprises three genera, the *Sarcoptes*, the *Psoroptes* and the *Symbiotes*.

Of the genus *Sarcoptes* there are several species, two only of which, however, affect mammals, viz., the *Sarcoptes* of scabies and the dwarf *Sarcoptes*. The latter are found on the heads of some small animals, such as the cat, rabbit, &c., and are not of great importance to stock-owners.

The *Sarcoptes* of scabies, on the other hand, comprise a large number of varieties, which live on man and many animals. This species, which is responsible for the most serious forms of parasitic skin diseases, is distinguished from other mange acari by the peculiar manner in which the female deposits her eggs, namely, in a burrow or gallery excavated for the purpose beneath the epidermis.

Of the genus *Psoroptes* there is but one species, although there are several varieties affecting different animals. It is this species of acarus which is responsible for the mange usually affecting both the cattle and horses of the western ranges. It must, however, be distinctly understood that a different variety infests each of the two species of animals mentioned, and that the malady is not transmissible from the horse to the ox or vice versa, although a slight temporary irritation of the skin may occasionally result from the transfer of the acarus.

All the mange insects are very minute, varying in length from 1-40 to 1-100 of an inch, the *Psoroptes* being slightly larger than the *Sarcoptes*, and consequently more easy of detection. The most certain mode of distinguishing true mange from other irritations of the skin, many of which closely resemble it in general characteristics, is, of course, the isolation of the acarus.

In the *Sarcoptic* form this is often difficult, as the parasites are usually deeply imbedded in the skin. The *Psoroptes*, however, can generally be detected by exposing to the sun's rays, preferably inside of a window, a quantity of the scabs and other debris scraped from the skin of the patient. After an hour or so of this exposure the movements of the acari, if present, can be detected with the aid of a good magnifying glass, although a low power microscope may be required to determine the exact variety to which they belong. It is needless to say that true mange is produced only by acari, and that it is impossible for the disease to originate in any way other than from contagion direct or indirect, although dirt, poverty and neglect undoubtedly favour its development.

The irritation of the skin is due, not to the bite nor to the movements of the parasite, but to a poisonous secretion or saliva which it introduces into the tissues, the most virulent being that peculiar to the *Psoroptes*.

The acarus once established on the skin of a congenial host, the symptoms of mange are not, as a rule, long in becoming apparent, although, for reasons not yet fully understood, the disease is usually much more active in the winter than during the summer season. This peculiarity has long been noted, and in Europe has been attributed to the warmth of winter stabling, but as the same condition is observable in animals constantly exposed to the weather, some other explanation is evidently required.

Mange, whether due to *Sarcoptes* or *Psoroptes*, gives rise to intense itching, accompanied by loss of hair, and later by effusion, thickening of the skin and the formation of scabs or crusts. Redness is also always present, although this cannot

be detected except in white or light coloured animals. As the disease advances the thickened skin, especially where loosely attached to the tissues, becomes corrugated in deep folds or ridges, this condition being very characteristic, in chronic cases. The progress of the disease, at first slow, soon becomes rapid, owing to the tremendous rate at which the parasites multiply. According to Gerlach, one pair of acari are capable of producing, through successive generations, within three months no less than 1,500,000 descendents. The period required for the eggs to hatch is short, varying from three to ten days, according to the favourable or unfavourable nature of the circumstances.

Sarcoptic scabies, although seldom seen in Canada, merits a brief description.

Of the larger animals, it affects the horse, ass and mule only, the ox being, so far as known, free from the attacks of this genus. The disease at first develops slowly, its specific lesions being seldom noticeable before the expiry of at least three weeks from the date of infection. It is generally first noticed in the region of the withers, whence it extends in an irregular manner over the surface of the body proper, the extremities usually being left untouched. If neglected it soon produces constitutional disturbance which, with the loss of rest and food due to the continual irritation, not unfrequently leads to a fatal termination. Cases of old standing are difficult to treat successfully, the disease frequently reappearing in animals apparently cured.

Except in the very early stages it is contagious in the extreme. Gerlach states that he has seen healthy horses become affected in fifteen minutes when placed alongside of mangy horses on which the disease had reached th scabby stage. The transmission is effected not through the eggs or the mature egg-laying females which are buried in the skin, but through the rapid movements of the younger individuals in both sexes. Many experiments have been conducted with the object of conveying *Sarcoptic* mange of the horse to animals of other species, and vice versa, but as a rule, without success, although a temporary irritation, disappearing spontaneously or yielding readily to treatment, may make its appearance. The irritation referred to is especially noticeable in man, and some authorities believe that the infection in this case is a real one, although actual proof to this effect is, so far, lacking.

Psoroptic mange of the horse, while not so intractable as that produced by the *Sarcoptes*, is still a very serious malady, capable, under favourable conditions, of causing great suffering to affected animals and corresponding loss to their owners.

It generally makes its appearance at or near the roots of the mane or tail, the first indication of infection being the rubbed or broken appearance of the long hairs of one or both of these appendages. Examination will reveal the presence of an eruption of small pimples containing fluid, which, on breaking, form a crust. This crust, as the exudation continues, becomes thicker, but remains moist, thus differing from that of *Sarcoptic* mange, which is dry and scaly. As the acari multiply, the disease gradually spreads from each centre of infection, and the irritation being greatly increased by constant rubbing, the skin eventually becomes thickened, inflamed and wrinkled, while the hair in many cases either falls out or is rubbed off.

Between the wrinkles is to be found a moist, filthy accumulation of broken scab, which, especially in warm weather, is offensive in smell, and contributes largely to the general skin irritation.

Psoroptic mange does not spread over the surface of the body as rapidly nor to as great an extent as the *Sarcoptic* form. Gerlach states, however, that the vitality of the *Psoroptes* when removed from the host, as for instance on blankets, brushes or harness, is greater than that of the *Sarcoptes*. They have been known to live for a fortnight in dry open air, and for twice that period in a stable. Many attempts have been made to transmit the disease from the horse to other domestic animals but without success.

Psoroptic mange of cattle presents few points of difference from that of the horse as described above, and, as already stated, is due to a very similar variety of the same species of acarus.

It is usually first noticed in the region surrounding the root of the tail, although it may also commence operations at the withers or on the neck. Its manifestations greatly resemble those observed in *Psoroptic* mange of the horse, and it has the same tendency to apparently recover in summer only to reappear with the return of the cold weather. It yields rapidly to treatment, and only becomes serious when neglected.

Symbiotic mange is, in horses generally confined to the legs, where it causes great irritation, and eventually loss of hair, thickening and inflammatory exudations. It is most frequently seen in heavy horses with hairy legs. It spreads very slowly, and yields readily to treatment.

Symbiotic mange of cattle is even less serious than in horses. It is seldom seen except at the root of the tail, and only extends to other regions when long neglected. It is very slightly contagious, and is amenable to simple treatment.

In animals properly domesticated the treatment of mange is comparatively simple.

Affected animals should be clipped, the place where the clipping is performed thoroughly disinfected, and the hair burned. The animal should then be well rubbed all over with soft soap, to which a small quantity of creolin or some similar agent may, with advantage, be added. This should be followed, after a lapse of several hours, by a thorough dressing with one or other of the preparations given below.

A very satisfactory and effective remedy consists of the following :—

Oil of tar	One part
Linseed oil	Twenty parts

to which should be added as much sublimed sulphur as the mixture will conveniently carry. These ingredients are to be heated gradually together, but must not be allowed to boil. This mixture should be well rubbed into the skin, and allowed to remain on for several days, when it may be washed off and the application repeated.

Another excellent remedy, which can be used in the same way, is known as Helmerich's Pomade, consisting of :—

Sublimed sulphur	200 parts
Potassium carbonate	100 "
Lard	800 "

Where oleaginous preparations are used, it is well not to cover the whole body at once, as the functions of the skin are liable to be suppressed, with dangerous results.

A most effective mixture consists of :—

Creosote	10 parts
Alcohol	10 "
Water	25 "

Or—

Creosote	1 part
Vegetable oil	30 parts

Zundel's Formula.

Crude carbolic acid	53 oz.
Quicklime	36 "
Carbonate of soda	107 "
Soft soap	107 "

Dissolve in 57 gallons of hot water.

Crude carbolic acid is preferred to the pure article, as the essential oils it contains are beneficial, but creolin can be substituted for either with good results.

Coal oil and benzine are excellent agents for the destruction of acari, but are apt to cause persistent irritation of the skin, which is difficult to distinguish from that due to the disease itself.

A useful kerosene emulsion, however, is the following :—

Hard soap	½ pound
Water	1 gallon
Kerosene	2 gallons

The water should be at boiling point when the other ingredients are added, and the mixture is to be constantly stirred until cool, when it may be dissolved in 60 gallons of hot water.

Where large quantities are required, as for dipping, any of the following preparations will be found suitable and convenient :

South African Official Mange Dip.

Flowers of sulphur	21 pounds
Unslaked lime	16¾ "
Water	100 gallons

The lime should be slaked so as to form a rather thick lime paste. The flowers of sulphur should then be added to this paste, and the whole well stirred. The mixture is then to be placed in a kettle with twenty-five or thirty gallons of boiling water, and boiled for two hours or more, during which time it should be stirred at intervals. After the sulphur disappears from the surface the mixture, including the sediment, may be poured into a barrel provided with a bung hole a few inches from the bottom. After being allowed to settle, the liquid is to be drained off through the spigot near the bottom of the barrel, and enough warm water added to make 100 gallons. The sediment is not to be used for dipping purposes, but can be utilized to advantage in the disinfection of fences, yards and buildings. All lime and sulphur dips are to be prepared in a similar manner.

Australian Dip.

Twenty-five pounds of sulphur and 18 pounds slaked lime, made into the consistency of thick cream.

By boiling the above for twenty minutes in 20 gallons of water, the sulphide and hyposulphite of calcium are produced. The resulting orange coloured liquid is finally mixed with sufficient water to make it up to 100 gallons.

Fort Collins Dip.

Flowers of sulphur	33 pounds
Unslaked lime	11 "
Water	100 gallons

A lime and sulphur dip recommended by the United States Bureau of Animal Industry is as follows :—

Flowers of sulphur	24 pounds
Unslaked lime	8 "
Water	100 gallons

As will be noted, the Australian dip is stronger than any of the other lime and sulphur dips mentioned above, and should therefore be used with some caution, as irritation, especially of the eyes, is liable to follow dipping in very strong preparations of this nature.

Recent experiments have shown that when the ingredients are mixed in the following proportions there is less waste of material than in any of the dips mentioned above, while the preparation is equally effective.

Flowers of sulphur	24 pounds
Unslaked lime	10 "
Water	100 gallons

This prescription is therefore recommended to Canadian stockmen, although any of the lime and sulphur compounds given above will, if properly prepared and used, be considered satisfactory to the department.

All applications will be found much more effective when used at a temperature as hot as can comfortably be borne, viz., from 100° to 110° Fahrenheit.

This is most essential, and many different methods of maintaining heat have been recommended. The department is now experimenting with a specially designed boiler, but as at present constructed, it is too clumsy and expensive for ordinary use.

In a bulletin recently published by Dr. Van Es, of the North Dakota Agricultural College and Government Experiment Station, a very simple and inexpensive mode of heating is described as follows :—

'The special heating apparatus spoken of consists of a pipe running alongside of the vat and communicating with it below and above. The pipe is provided with several elbows by means of which a straight piece is placed parallel to the vat, at some distance from it, in an open trench. In this trench a fire is maintained and the whole arrangement is so made that the pipe is well surrounded by the fire. As the pipe slightly inclines, the heated water escapes upward into the vat, while its place is taken by colder water entering the pipe from below. The water thus being kept in circulation, gradually reaches the required temperature. Instead of a single pipe, a coil of pipes may be used, by which arangement a greater surface is exposed to the heat of the fire and the required temperature can be obtained in a shorter space of time.

'The same fire may be made use of to prepare the dip by placing the tank in which this is to be boiled over the trench.'

By coiling the pipe and inclosing it in a galvanized iron box, the heat can be economized and a considerable saving of fuel affected.

Treatment, to ensure success, must be repeated after an interval of at least ten days.

Horses suffering from *Sarcoptic* mange frequently require three or four dressings.

In addition to treating affected animals, it is of course necessary to thoroughly cleanse and disinfect stables, yards and corrals in which they have been kept, as also all articles with which they have, in any way, been brought in contact.

Too much care cannot be exercised in dealing with any of the forms of disease produced by mange acari, as they are insidious to a degree, and frequently reappear after all danger is thought to be past.

J. G. RUTHERFORD,
Veterinary Director General.

OTTAWA, June, 1904.

SESSIONAL PAPER No. 15

DIPPING PLANTS.

The illustrated description of dipping plants which follows is reprinted, by permission, from Farmers Bulletin No. 152, of the United States Bureau of Animal Industry, its author being Richard W. Hickman, V.M.D., chief of the miscellaneous division.

Of the various dipping plants in use, there are but two kinds that need description—the small dipping plant, which is inexpensive and suitable for use by a community of farmers, and the larger dipping plant with swimming tank, such as would be needed if large numbers of range cattle are to be treated. A suitable plant for a community of farmers has been built for $150, while a swimming tank will cost $350.

Such a plant as that in operation 18 miles north of Steele, North Dakota, known as the Langedahl, would seem to be an admirable example of the smaller kind. This plant, with the exception of the tank, was built by farmers. A threshing engine was used for heating purposes by connecting a 1¼-inch pipe to the whistle intake, the whistle being removed, and the pipe joined to the union. The plant has a capacity of 200 head per day. Its cost, without engine or labour, excepting the labour to build the tank or vat, was $150. One person can easily lower the cage, when loaded by taking a hitch around a post, and it may be raised, as shown in illustrations, either with engine or horses.

MATERIALS FOR PLANT.

Following are the illustrations (figs. 1-15) and list of materials for the smaller plant, the tank of which may be filled with dip made as per preceding formula for about $7.50. The drawings from which the illustrations were made and list of materials were furnished by Dr. Robert H. Treacy:

Entrance pen and chute.

65 plank 2 inches x 6 inches x 16 feet.
28 posts.
18 braces 4 inches x 4 inches x 4 feet.

Tank or vat.

800 feet good 2-inch plank.
400 running feet tongue strip.
10 pieces 4 inches x 4 inches x 16 feet.
2 pieces 2 inches x 6 inches x 16 feet.
10 pounds lead.

Cage.

8 pieces 4 inches x 4 inches x 16 feet.
8 pieces 2 inches x 4 inches x 16 feet.
12 pieces 2 inches x 10 inches x 16 feet.
10 pieces 1 inch x 10 inches x 16 feet.
4 half-inch iron rods, with ring in each end, 5½ feet long.
2 half-inch iron rods, with ring in each end, 4 feet long.
3 pairs of heavy hinges.

Derrick.

2 pieces 6 inches x 6 inches x 20 feet.
1 piece 6 inches x 6 inches x 10 feet.
6 pieces 4 inches x 4 inches x 12 feet.

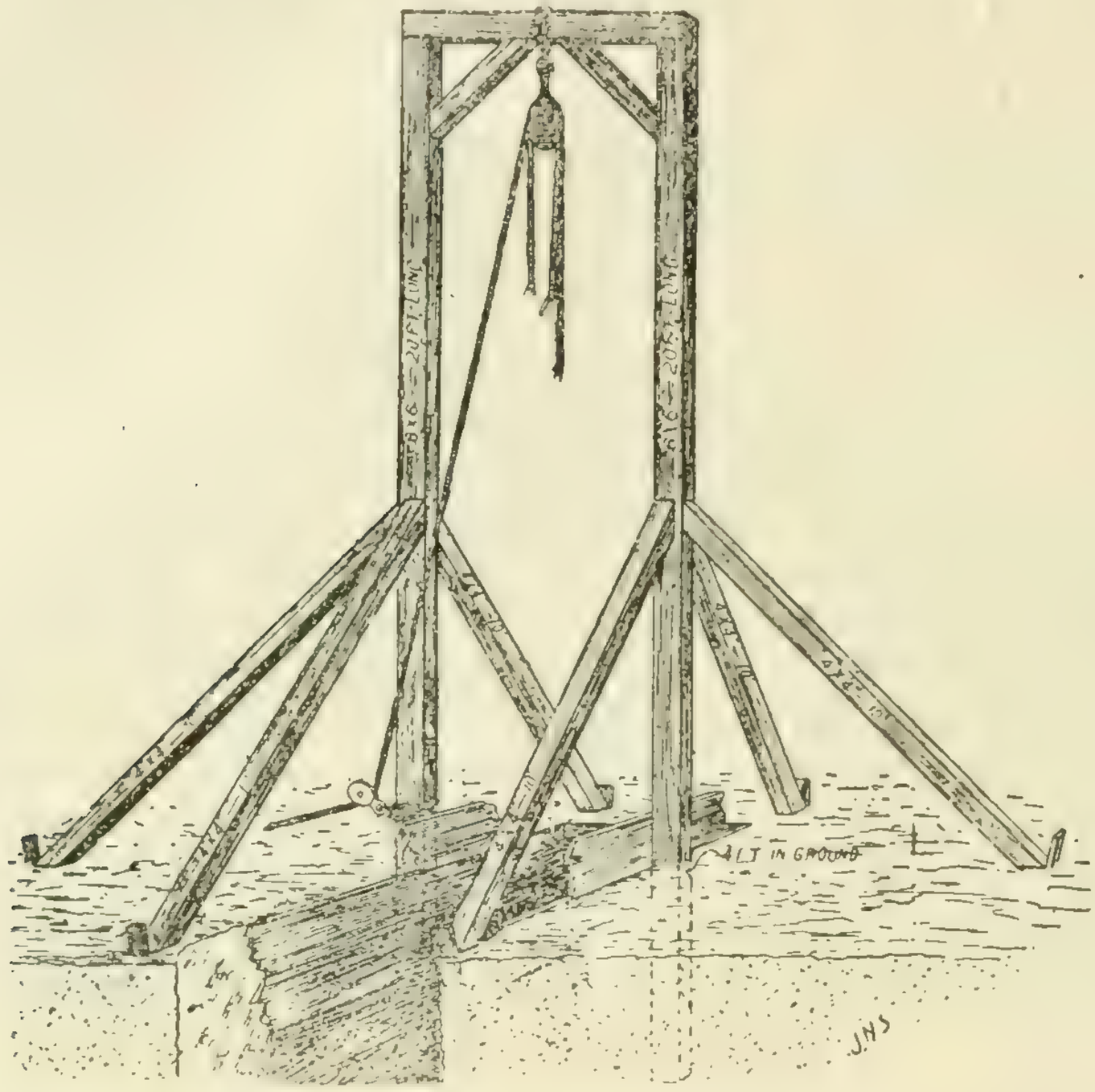


Fig. 1.—Derrick. Sixteen ft. high above ground. Derrick posts 4 ft. in ground, 6 by 6 by 20 ft. long. Braces 4 by 4 by 10 ft. long ; 2 double-leaf 6 in. blocks at top of derrick, and 1-leaf 5-in. pulley at bottom of derrick ; 100 ft. of 1-in. rope.

Drip Chute.

10 pieces 2 inches x 6 inches x 14 feet.
4 pieces 2 inches x 12 inches x 14 feet.
4 pieces 4 inches x 4 inches x 16 feet.
1 pair heavy hinges.
1 gallon tar.

Holding pen.

32 cedar or oak posts.
200 pounds wire.
5 pounds staples.

Hardware and incidentals.

100 pounds 20-penny spikes.
20 pounds 40-penny spikes.
2 6-inch double-leaf blocks.
1 5-inch single-leaf block.
100 feet 1-inch rope.
25 feet 1½-inch iron pipe.
1 galvanized-iron heating tank (5 barrels capacity).
4 oil barrels.

ADVANTAGES OF THE DIPPING PLANT.

A plant of this capacity will answer very well in a community where various owners have bunches of cattle ranging from 80 to 100 head or less. Among its chief advantages over the swimming tank are cheapness in construction, because of its size, and proportionately smaller expense in operating; the dip can be kept at the re-

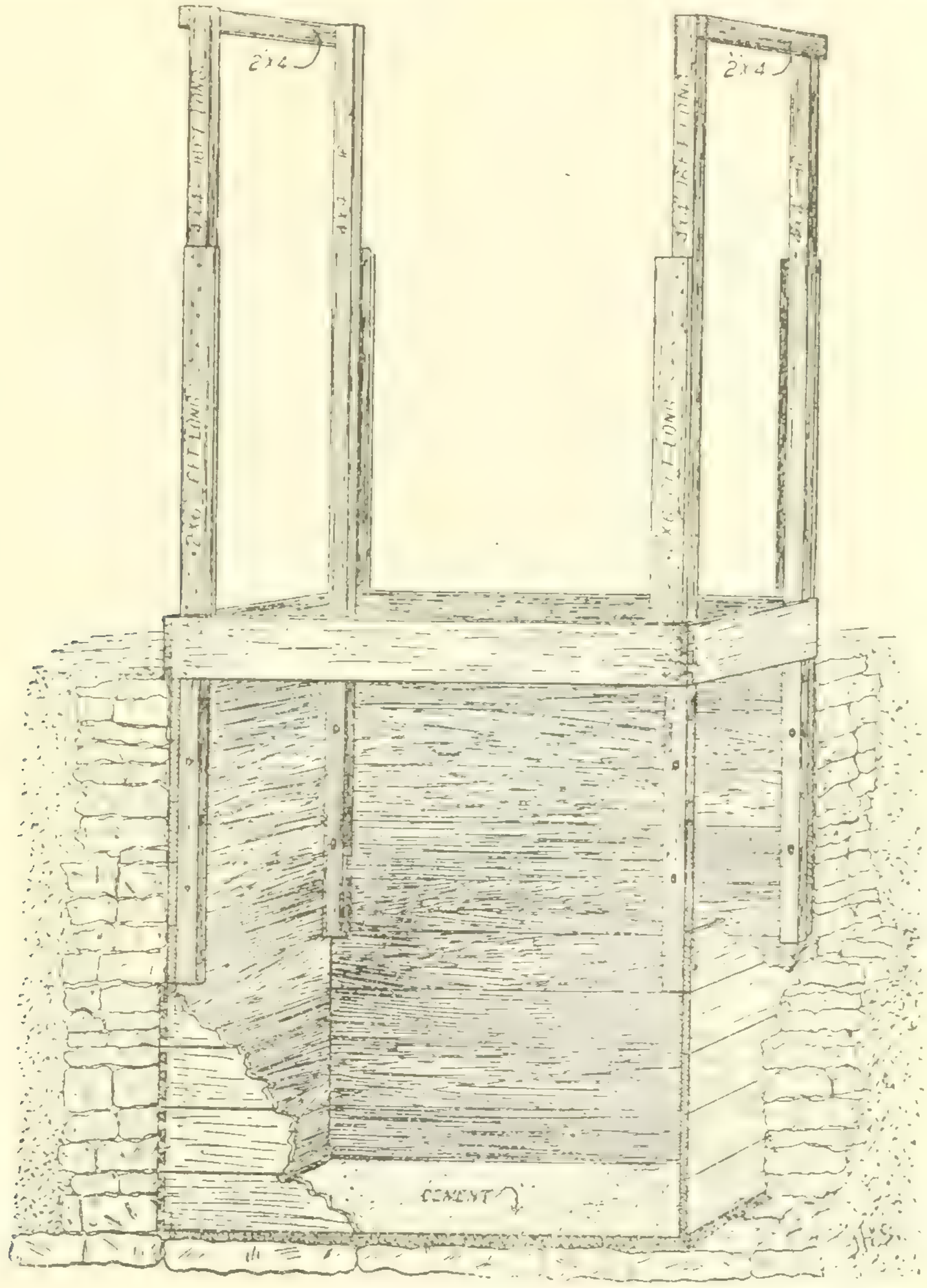


Fig. 2.—Vat. Tank 10 ft. deep, 4 ft. wide, 9 ft. in ground. Should contain from 5½ to 6 ft. of dip. Standards 4 by 4 by 16 ft. long, bolted to tank inside, to extend 6 ft. inside of tank, to act as guides to cage; 2 by 6 in. plank 6 ft. long nailed outside of standards; 2 by 4 or 2 by 6 in. braces across top of standards. The tank should be built of 2-in. plank and joined with a tongue, the ends of the tank mortised in, the joints coated with lead. The braces are 4 by 4. The tank, being placed in the ground and packed solid, does not require much bracing. The tank should be laid in cement bottom,wi th stone and mortar about sides .

quired temperature with facility, because of its lesser volume, and the submerging of the animals, as well as the length of time it is desired to keep them in the dip, can be more easily regulated.

In communities where mange does not exist, and where numbers of small herds are infested with lice, a plant of this character might be constructed and used with profit to the cattlemen. Many of the cattle were dipped during the past year because of having been exposed to mange, or scabies, by being herded with those

affected, showed much improvement in condition soon after dipping, as they were infested with lice to a considerable extent, although showing no distinct evidence of

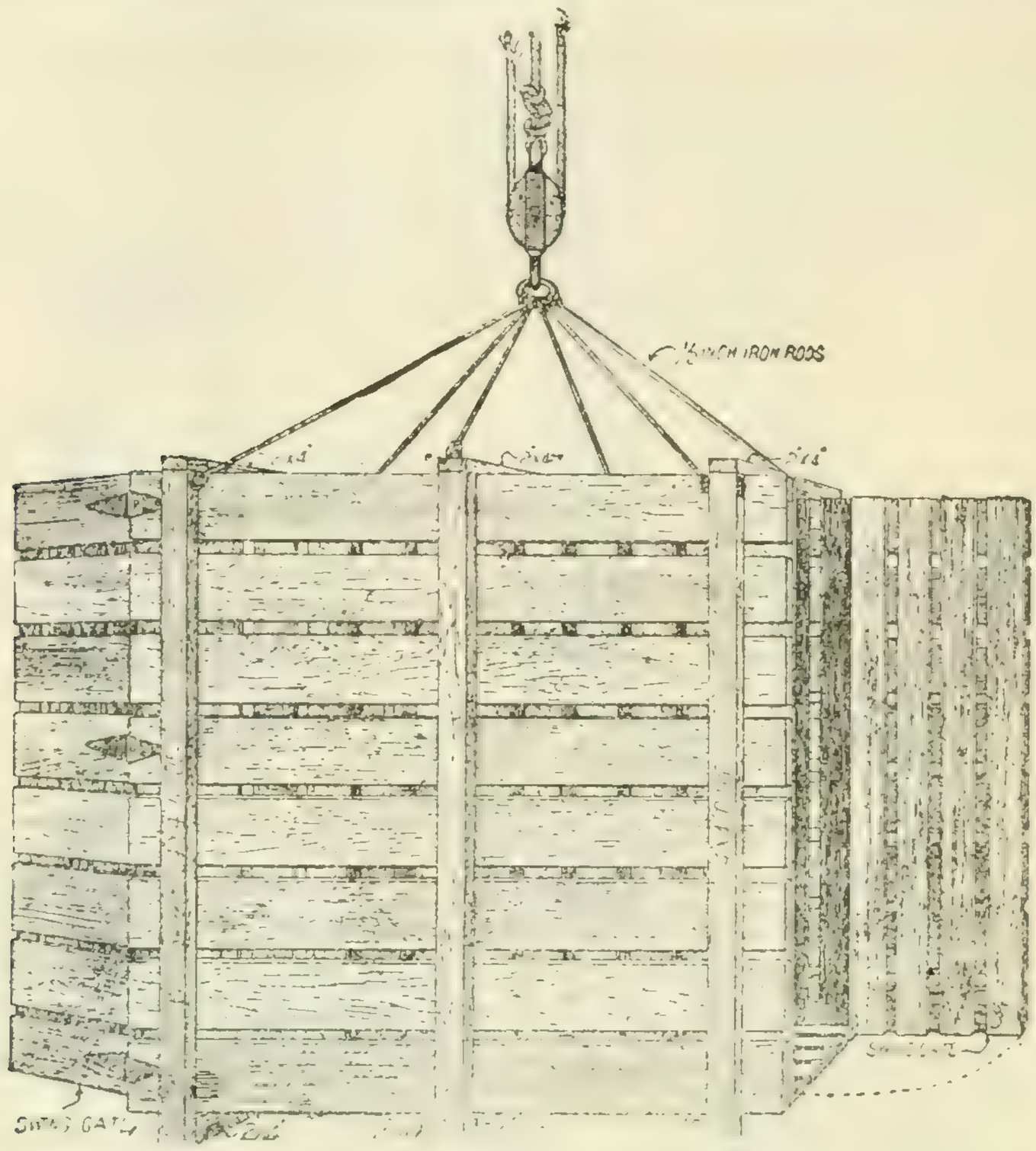


Fig. 3.—Cage. Eight ft. long, 8 ft. high, 2½ ft. wide—inside measurement; 2-in. plank used for outside, boarded up and down inside with 1-in. boards to keep animals from climbing up sides. Plank 2 in. apart. Inside boards 2 in. apart, and 1-in. cracks in floor to allow free escape of dip fluid.

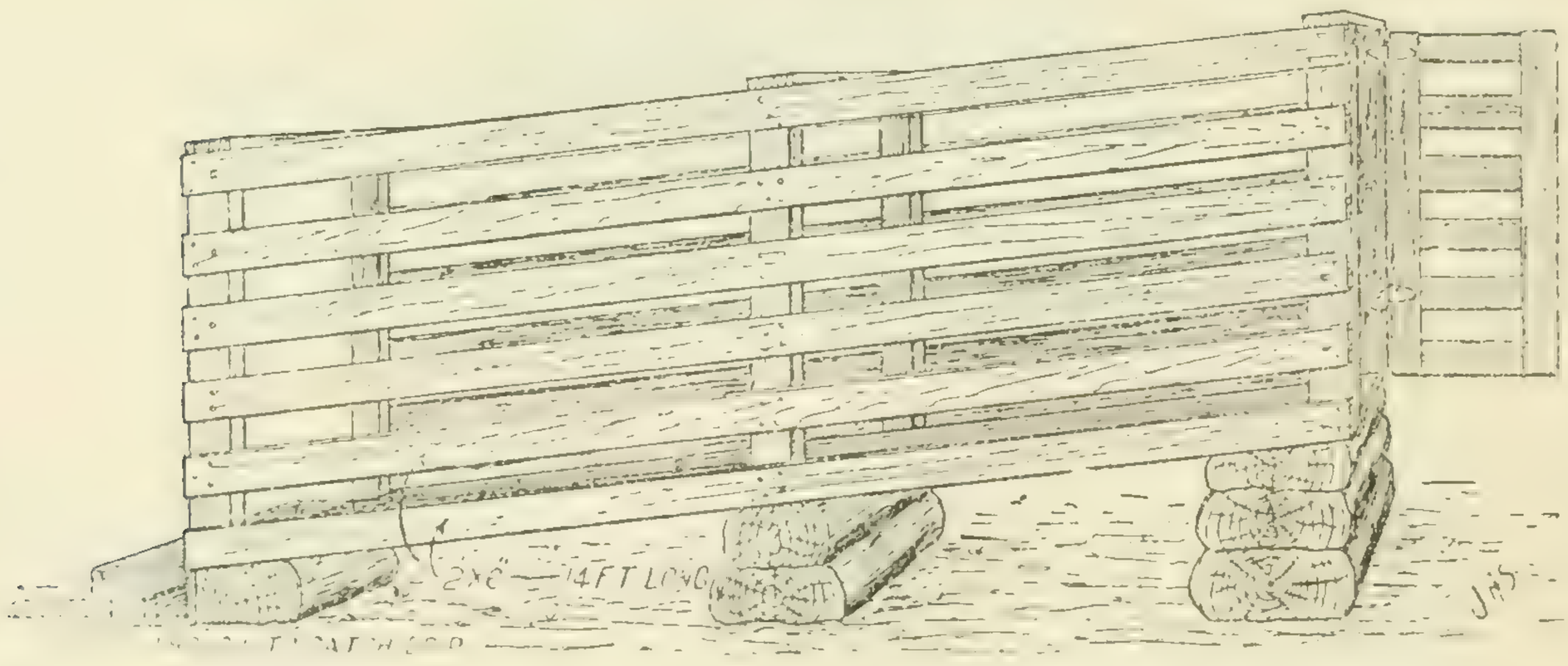


Fig. 4.—Drip shute. Fourteen ft. long; 2 by 6-in. plank; 5 ft. high. Set with 18-in. slope from front to rear. Trough at rear to catch drip, from which a pipe may be run to connect with tank to carry drip from drip chute back into tank. Floor of drip chute should be tight to prevent waste.

being affected with mange. It was observed that the lousy and mangy cattle stopped rubbing or digging after the first dip, and improved rapidly after being relieved of the torture that is inflicted by both of these troublesome parasites—scab mites and lice.

SPECIFICATIONS FOR LARGE DIPPING PLANT WITH SWIMMING TANK.

The following plans and specifications are for the construction of such a dipping plant as that of the Rice Lake Cattle Company, and are in accordance with the drawings made for that company after the following specifications, made by A. Van Horn:

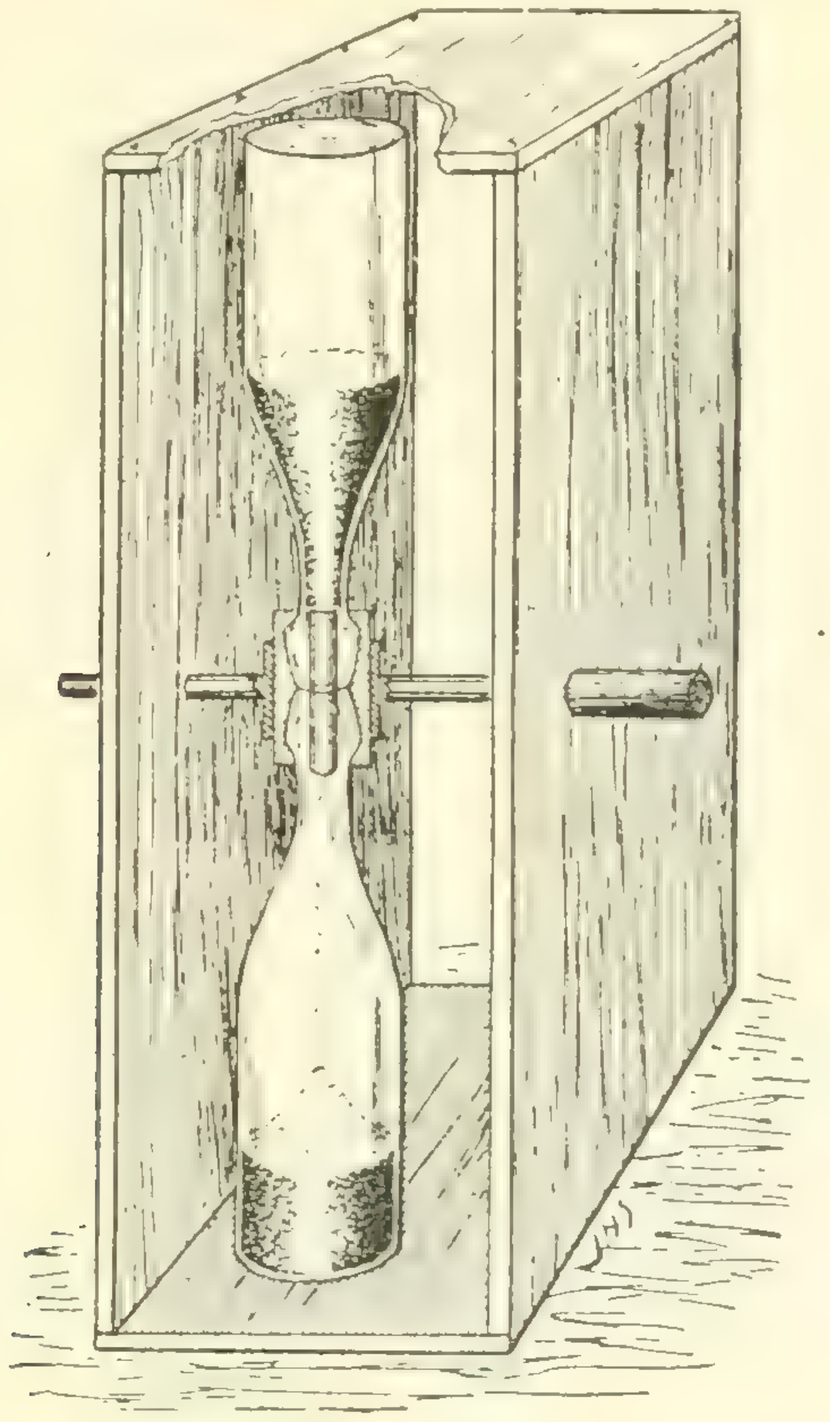


Fig. 5.—Sand glass. For timing the animals in the dip. Is made of two ordinary ketchup bottles, connected by a hollow wooden cork, placed in a box, and the box hung on a pin through the centre to revolve, as shown in the illustration.

LABOUR REQUIRED.

Excavations.—Excavate for the vat, as shown by the drawings, to the proper depth; level the bottom of the pit for the sills of the vat. After the vat is completed and the outside has been coated with coal tar, fill in around the vat, using the surplus earth to bank up and grade the sides of the vat above the natural grade, sloping the banks from the vat. Dig all holes required for the gate and fence posts.

Carpenter Work.—All work must be done in a skilful and workmanlike manner; the framework of the vat to be bolted and spiked together; the plank of sides, ends, and bottom of the vat and dripping floor to have edges bevelled for the calking as per detail, well driven together and well spiked with 20d. wire nails, using 40d. nails on the 3-inch plank. Calk all seams with oakum, well driven in with a calking iron and pitched. The exit, or inclined end, of the vat to have 3-inch bottom plank; all other plank of the vat and dripping floor to be 2 inches thick. Top of vat to be tied with 4 x 4-inch ties across top, framed and bolted to uprights as shown. Put 2 x 12-inch splashboards, on sides at top of vat, nailed to under side of the tie timbers and braced. The exit end of vat and dripping floor to be cleated with 1½ x 3 inch strips, well nailed to floor and bottom. Construct the trap at entrance—30 x 84

inches—of 2-inch plank, with 2 x 10-inch battens bolted together, top to be covered with 14-gauge sheet steel. Trap to swing on a 2-inch wrought-iron pipe or 2-inch

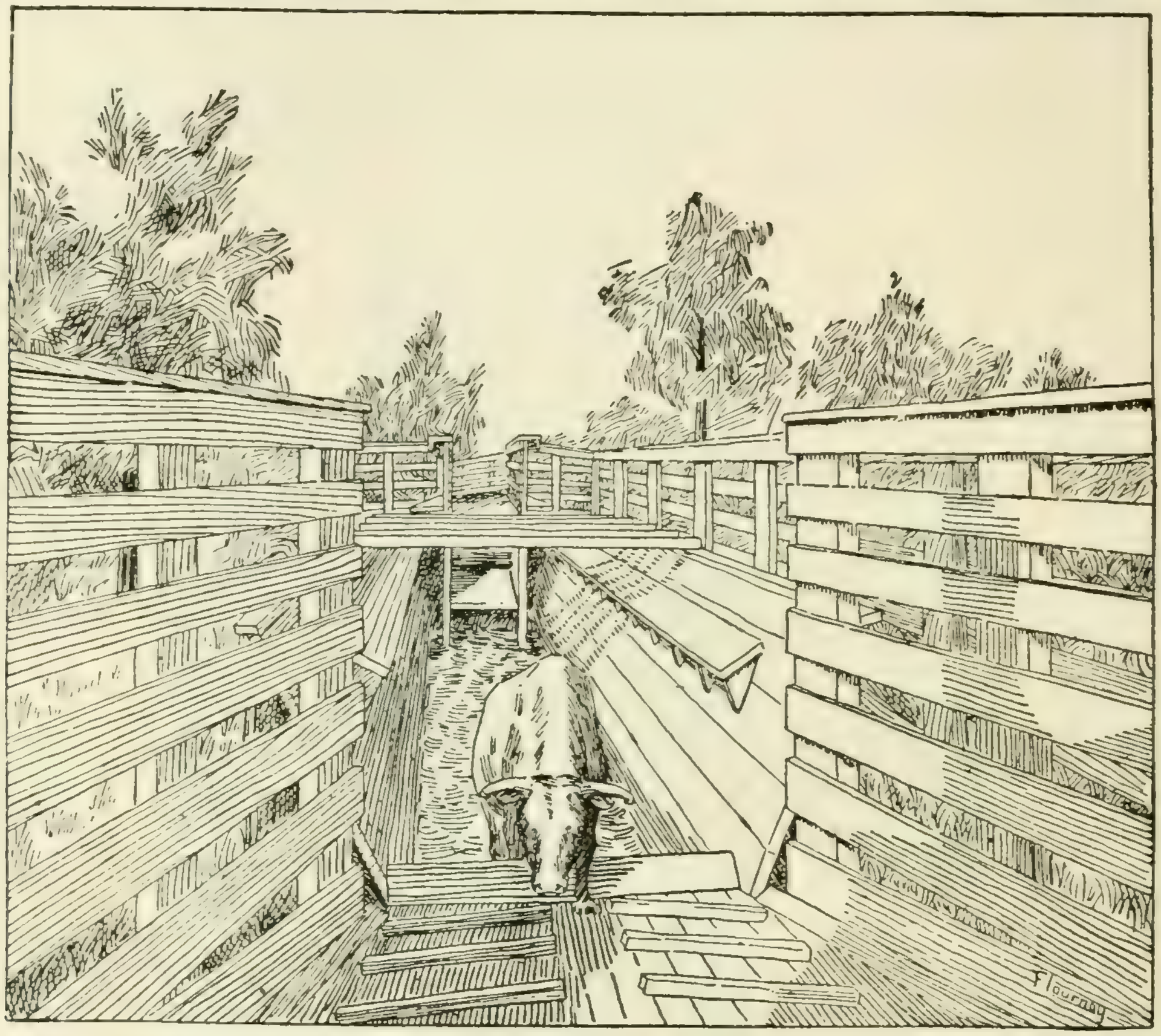


Fig. 6 Steer emerging from dipping vat, or swimming tank, of large plant.

steel bar seated in the end of vat, with ½ x 4 x 12-inch iron sockets bolted to vat. Secure the trap to the axle with iron straps bolted to underside of the centre battens. End of vat to have false back as shown.

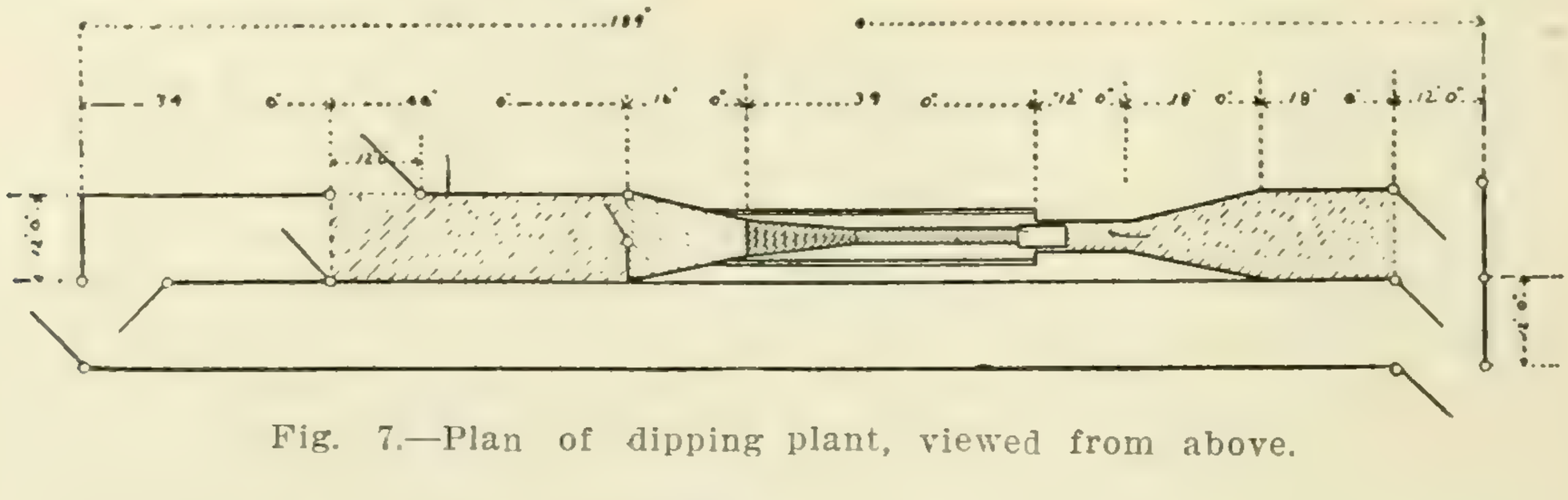


Fig. 7.—Plan of dipping plant, viewed from above.

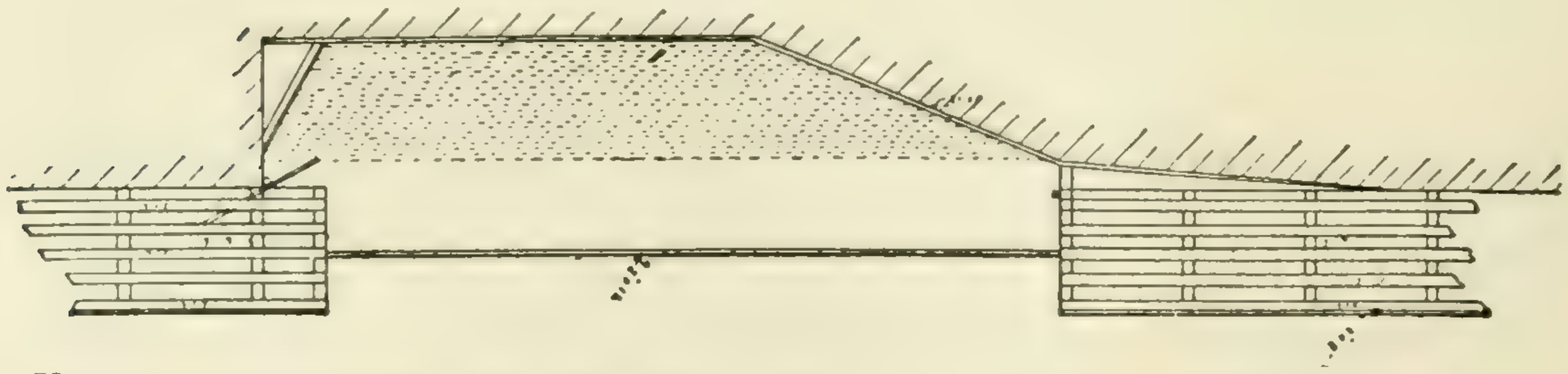


Fig. 8.—Vertical section of dipping vat, with older-style automatic trap on pivot. It will be seen that the incline at the bottom of the trap end of the vat is in a perpendicular line with the free end of the trap; where the spring trap is used, the length of the incline should be increased in order that at the bottom of the vat it may still be in line perpendicularly with the end of the trap when set; otherwise cattle are liable to get back under the trap, causing trouble.

Gates and fence.—Construct and erect the gates and fences as per drawings. The gate post to be set 4 feet in the ground and the fence posts 3 feet 6 inches. Set all

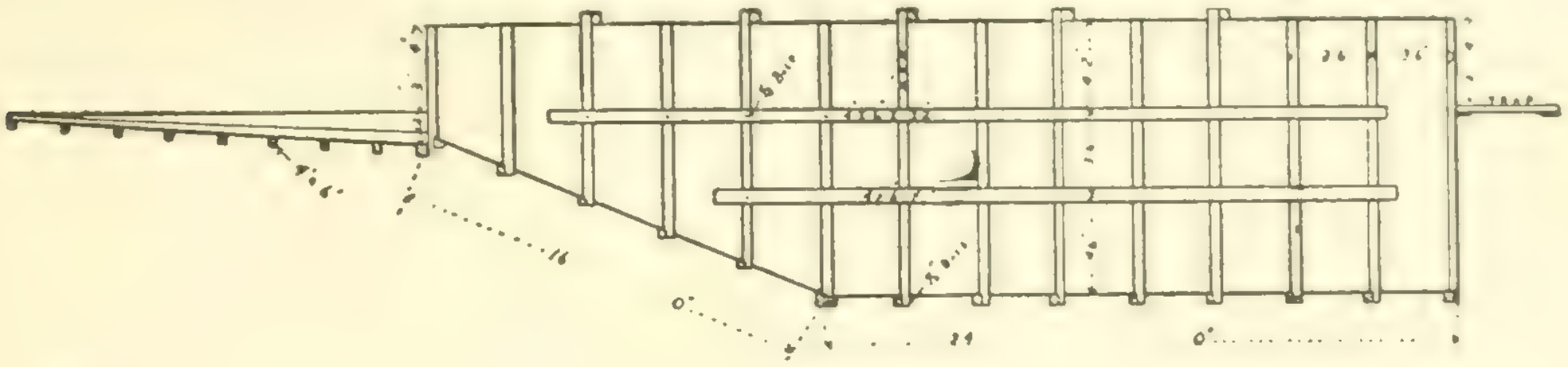


Fig. 9.—Side view of dipping vat, showing inclined egress and dripping floor.

posts plumb and to a line; well and thoroughly tamp the earth around the posts. . The bottom of all posts to be coated with coal tar before being set. Gate posts to be

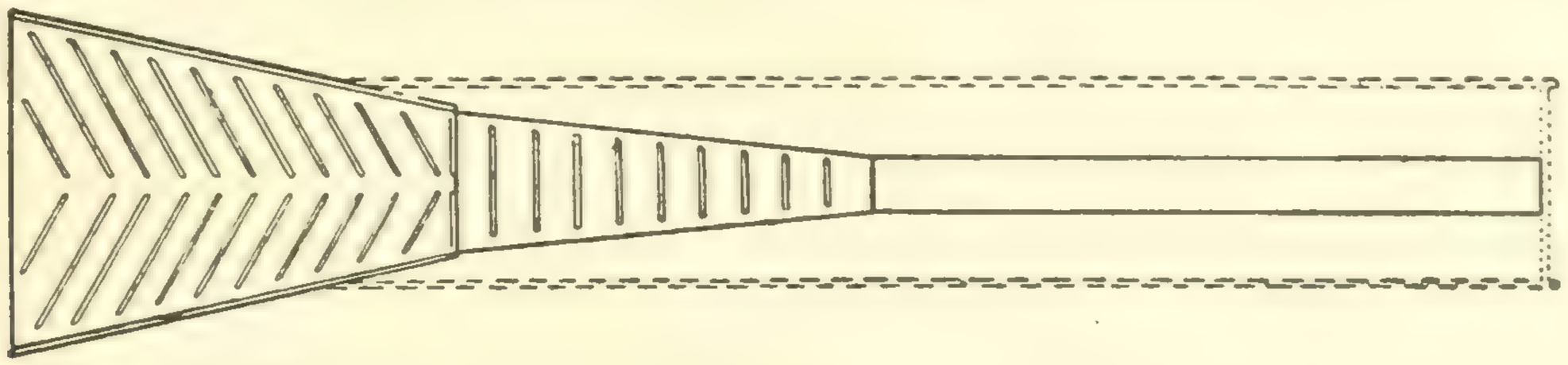


Fig. 10.—Swimming tank with incline and drip chute, looking from above.

8 x 8 inches, with 6 x 8-inch tie framed and driftbolted to the posts. Fence posts to be 6 x 6 inches. The gates to be bolted and spiked together and braced as shown.

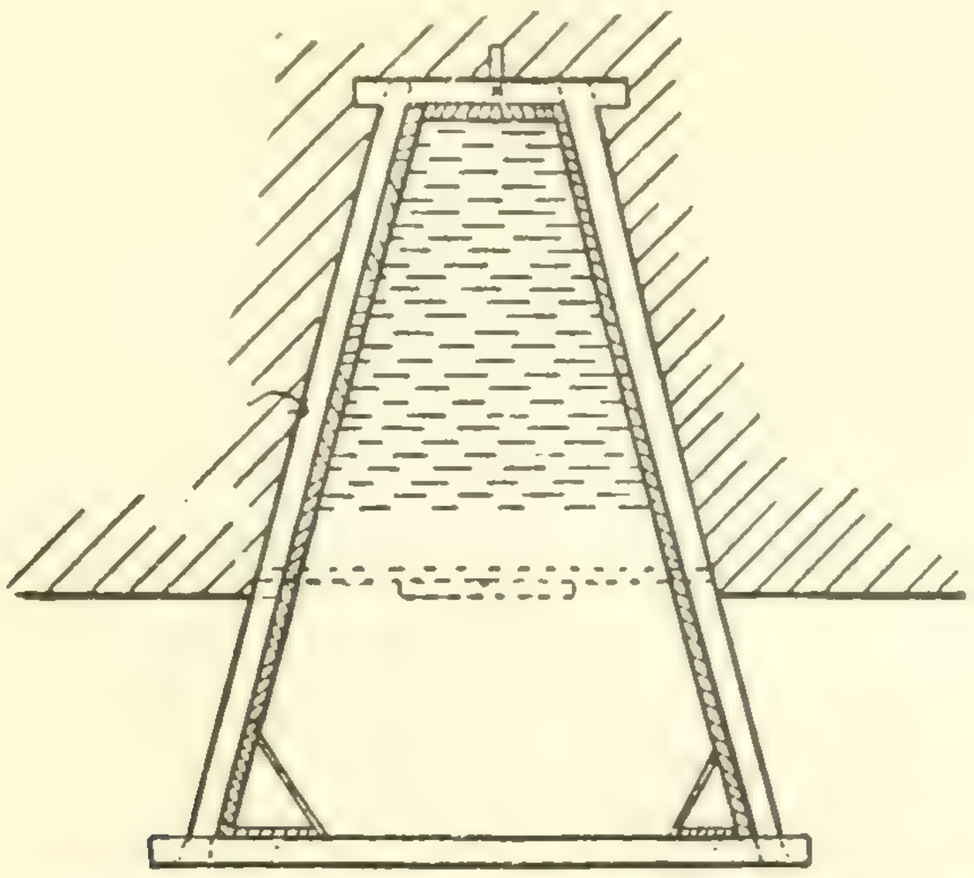


Fig. 11.—Vertical section of swimming vat, showing end of trap.

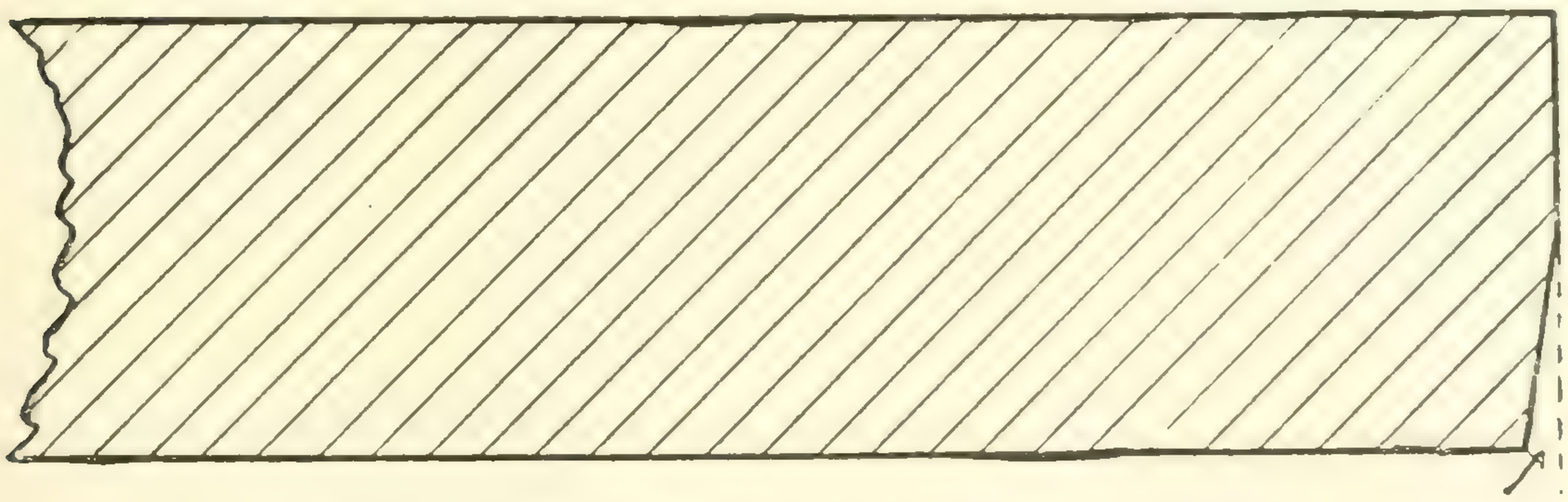


Fig. 12.—Plank showing bevelled edge for calking.

To be hung with $\frac{1}{2}$ x 3 x 36-inch strap eye-and-bolt hinges. Bolt to run through posts and hinges bolted to gates. Gates to have $\frac{1}{2}$ x 3 x 16-inch iron hasp bolted to gates and a suitable bolt staple, with iron pin and chain for locking.

Fence.—The fences to be five-railed, with cap, ribbon fence. Rails, or ribbons, to be of 2 x 6 inches, with 2 x 8-inch cap, spiked at each bearing with two 40d. wire nails. Posts to be set 8 feet on centres, or nearer, where distance may require.

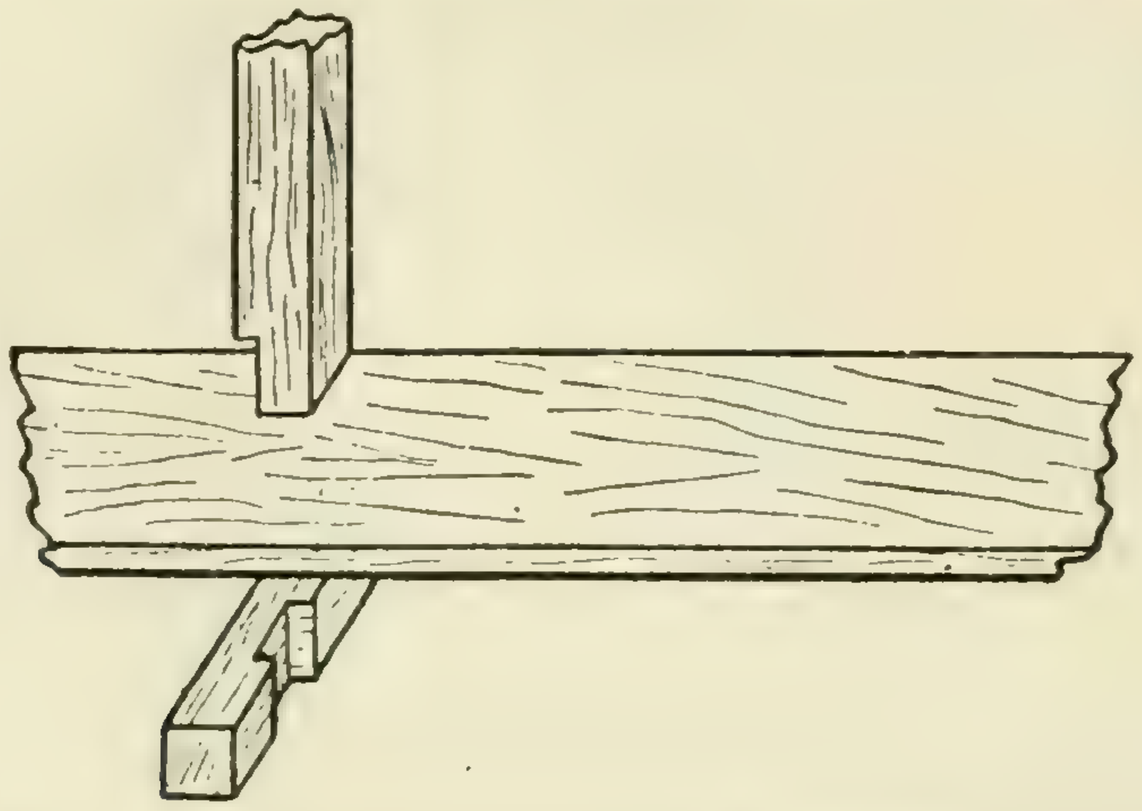


Fig. 13.—Sill and upright, showing method of joining.

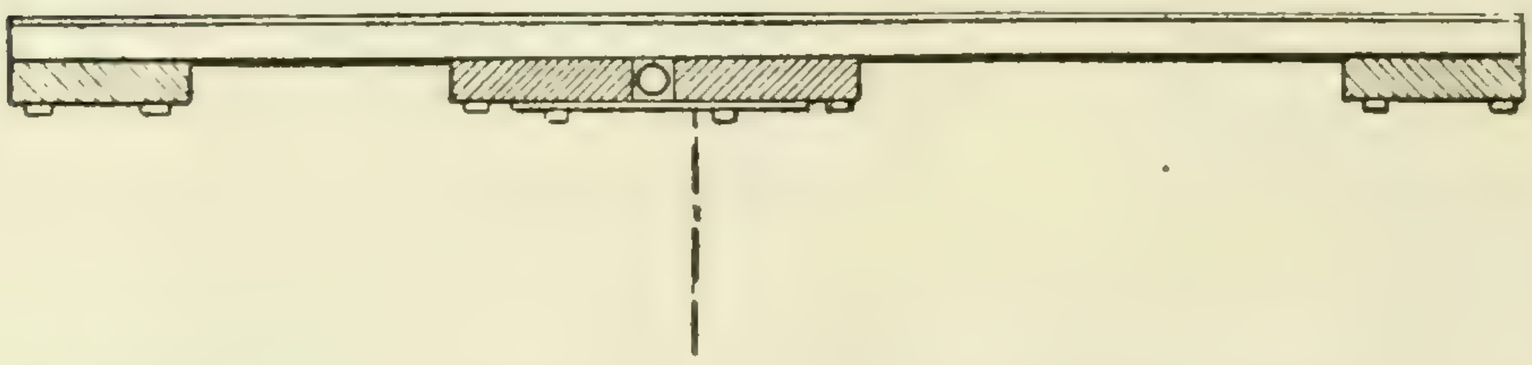


Fig. 14.—Vertical section of an older style of automatic trap, showing 2-in. iron pipe upon which trap is pivoted.

Lumber.—All lumber to be No. 1 pine or fir dimension, free from shakes, bark, large pitch pockets, unsound knots, or other imperfections that materially impair its strength, durability, and use for which it is intended.

Drainage.—The vat to have a 2-inch waste pipe fitted in the bottom with gate valve and elbow, and 20 feet of pipe to run horizontally under ground, with a fall of 2 feet on 16 feet. At this point the owner will take up the drainage without cost to the contractor, and continue the same to a suitable point either by pipe or open ditch.

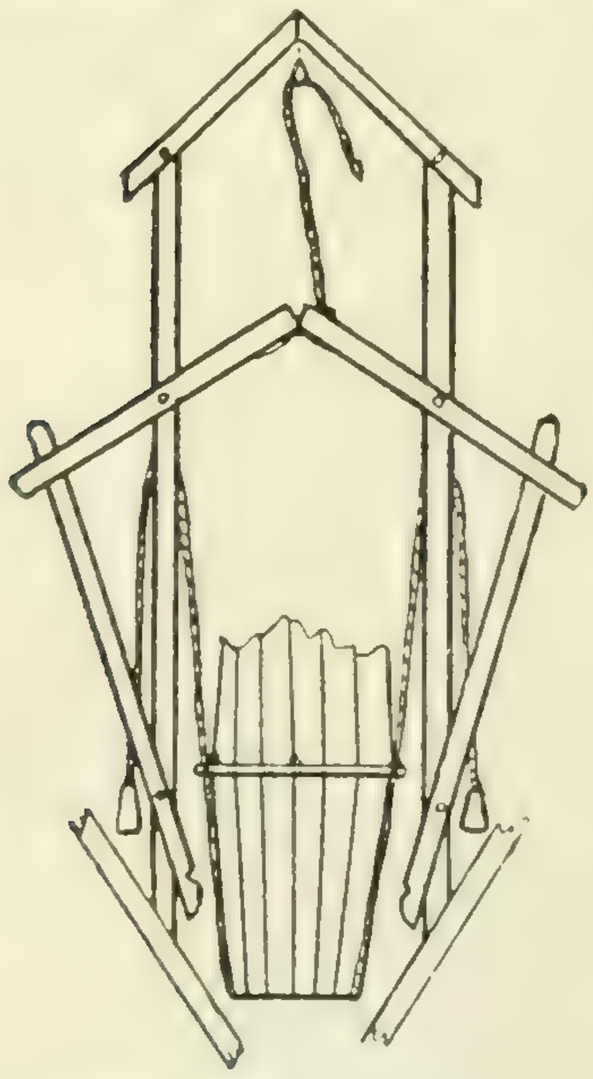


Figure 16.—Spring trap sprung. This trap is hung on an iron rod or on a 2-in. iron pipe; weights are attached at the free end to pull it back in place; it then sets automatically.

Dimensions of Vat.—Perpendicular depth of vat to be 10 feet; width at top, 7 feet; width at bottom, 2 feet; length of level bottom, 24 feet; horizontal length of sloping bottom, 15 feet; width of dripping floor at upper end, 12 feet; at lower end, 5 feet.

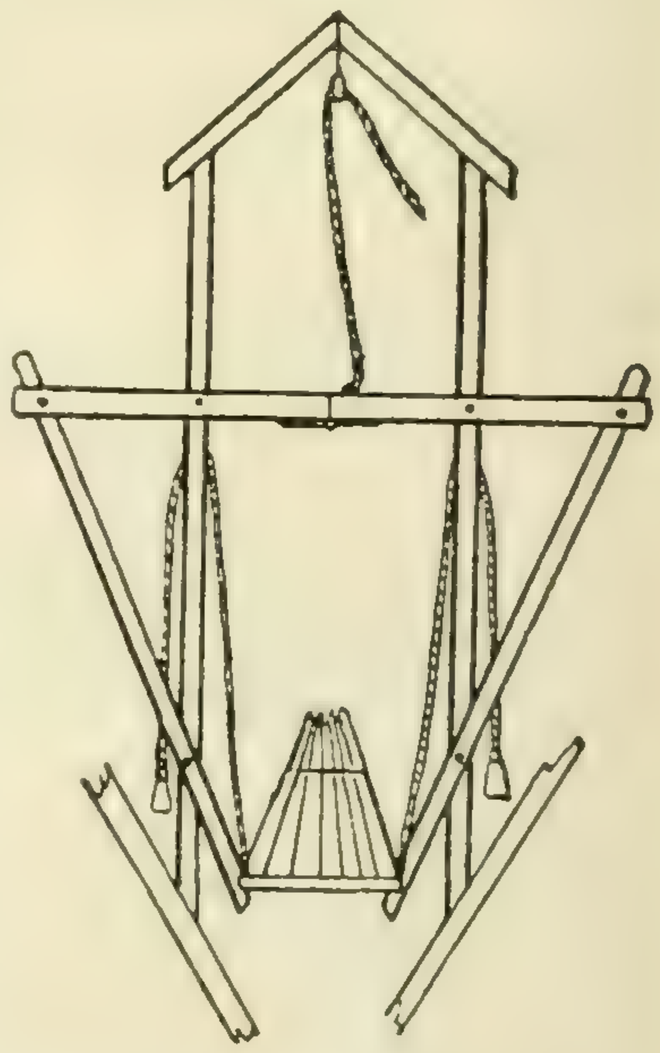


Figure 15.—Spring trap set.

Floors of Pens.—Should the owner decide to floor the catch pen and holding pen No. 1, the floor will be of 2-inch plank nailed to 4 x 4-inch joists or sleepers let into the ground and levelled. The sleeper to receive one coat of coal tar before being laid.

LUMBER BILL.

Vat and dripping floors.

Planks for sides, ends	1,080 feet =	30	pcs. 2″	x 12″	x 18′	No. 1 pine or fir.
	576	24	2	12	12	"
	64	2	2	12	16	"
	96	2	2	12	24	"
False back and bottom . .		or 3			16	"
	240	5	3	12	16	"
	72	2	3	12	12	"
	24	1	4	4	18	"
	37	2	4	4	14	"
	64	3	4	4	16	"
	32	2	4	4	12	"
	27	2	4	4	10	"
Sills, uprights, and ties . . .	64	2	4	6	16	"
	336	21	4	4	12	"
	96	4	4	4	18	"
	21	1	4	4	16	"
	19	1	4	4	14	"
Splash boards	160	4	2	12	20	"
Cleats	54	9	1½	3	16	"
Trap	23	1	2	10	14	"
	30	1	2	10	18	"
Total	3,115 feet.					

Gates.

Posts	896 feet =	14	pcs. 8″	x 8″	x 12′	No. 1 pine or fir.
Tie beams	448	8	6	8	14	"
Ribbons	480	40	2	6	12	"
Braces	144	8	2	6	18	"
Battens or rails	96	6	2	6	12	"
	128	4	4	6	16	"
Total	2,192 feet.					

Fence.

Posts	2,010 feet =	67	pcs. 6″	x 6″	x 10′	No. 1 pine or fir.
	240	20	2	6	12	"
	140	10	2	6	14	"
Ribbons	1,760	110	2	6	16	"
	450	25	2	6	18	"
	64	4	2	8	12	"
	32	2	2	8	14	"
Caps	469	22	2	8	16	"
	120	6	2	8	18	"
Total	5,285 feet.					

NOTE.—Oak or cedar posts are to be preferred. If round cedar posts are used, substitute 10-inch round posts for the 8 x 8-inch and 8-inch round posts for the 6 x 6-inch posts as above.

For catch pen.—There should be a plank floor in the catch and holding pen No. 1, but if only a limited number of cattle are to be dipped this may be omitted.

If it is decided to floor these pens the following material should be added to the foregoing lumber bill:—

For holding pen No. 1..	240 feet = 15 pcs. 4″ x 4″ x 12′ No. 1 pine or fir.	
	850 feet 2″ pine or fir plank, 12″ x 18′.	
	240 feet = 15 pcs. 4″ x 4″ x 12′ No. 1 pine or fir.	
	960 feet 2″ plank 16′.	
Total..	2,290 feet of additional lumber.	

Cottonwood lumber may be used where the market price of same would make it practical.

SCHEDULE OF HARDWARE, &c.

Vat and dripping floor.

42 carriage bolts, ½″ x 6″, with washers.
40 carriage bolts, ½″ x 8″, with washers.
18 carriage bolts, ½″ x 4″, with washers.
40 lbs. 20d. common wire steel nails.
10 lbs. 30d. common wire steel nails.
15 lbs. 50d. common wire steel nails.
1 sheet No. 14 sheet steel 30″ x 84″, with 1 gross 1″ No. 10 screws.
20 lbs. oakum.
40 lbs. pitch.
10 gals. coal tar.
5 feet 2″ pipe or steel bar, for trap.
21 feet 2″ wrought-iron pipe, with couplings.
1 elbow, 2″.
1 flange for securing pipe to bottom of tank, 2″.
1 gate valve, 2″.

Gate and fence.

8 pairs eye-and-bolt hinges, heavy, ½″ x 3″ x 36″.
8 hasps, ½″ x 16″ x 3″, with bolt staple, for 8″ posts.
48 bolts, ½″ x 3″.
20 bolts, ½″ x 4½″.
68 bolts, ½″ x 6″.
160 bolts, ½″ x 4″.
32 driftbolts, ½″ x 12″.
20 lbs. 30d. common wire nails.
65 lbs. 40d. common wire nails.
16 gals. coal tar.

NOTE.—If catch and holding pen No. 1 is to be floored, add to the above 30 lbs. of 30d. wire nails and 5 gallons coal tar.

SESSIONAL PAPER No. 15

PRIVY COUNCIL, CANADA.

AT THE GOVERNMENT HOUSE AT OTTAWA,

THE 27TH DAY OF JUNE, 1904.

PRESENT:

THE GOVERNOR GENERAL IN COUNCIL.

Whereas by an Order in Council of the 4th day of March, 1904, regulations were established for the purpose of eradicating a disease in live stock in the Northwest Territories known as mange;

And whereas the Veterinary Director General reports that he deems it advisable that renewed active measures be taken with a view to preventing the possibility of the spread of this disease in other parts of the Dominion;

Therefore the Governor General in Council is pleased, in virtue of the provisions of section 29, of the Act 3, Edward VII, chapter 11, intituled 'An Act respecting Contagious or Infectious Diseases affecting Animals,' to order that the regulations established by the Order in Council of the 4th day of March, 1904, relating to mange in live stock in the Northwest Territories, shall be and the same are hereby rescinded, and the following regulations governing the whole Dominion substituted therefor:—

1. Every owner, breeder or importer of or dealer in animals, shall on perceiving the appearance of mange among the animals owned by him or under his special care, give immediate notice to the Minister of Agriculture and to the nearest Veterinary Inspector of the Department of Agriculture of the facts discovered by him as aforesaid.

2. Every veterinary surgeon practising in Canada shall immediately on ascertaining that an animal is affected with mange give similar notice to the Minister and to the nearest veterinary inspector.

3. In the Northwest Territories the notice required to be given by the two preceding sections of these regulations shall be deemed sufficient if given to the commissioner, assistant commissioner, or other officer of the Northwest mounted police force, or to one of the veterinary staff sergeants of the said force.

4. Every person having in his possession or keeping an animal affected with mange, shall forthwith cause such animal to be treated in a manner satisfactory to the nearest veterinary inspector or other duly authorized person.

5. No animal which is affected with or has been exposed to mange shall be permitted to run at large or to come in contact with any animal which is not so affected.

6. Any veterinary inspector or other duly authorized person may declare to be an infected place within the meaning of 'The Animal Contagious Diseases Act, 1903,' any common, field, stable, cowshed, or other place or premises, also any market, railway yard, stockyard, pen, wharf, railway car or other vehicle where the contagion of mange is known or suspected to exist.

7. Every veterinary inspector and every person duly authorized by a veterinary inspector shall have full power to order animals affected or suspected of being affected with mange to be collected for inspection, and when necessary, to be detained, isolated or treated in accordance with the instructions of the Veterinary Director General.

8. The expenses of and incidental to such collection, isolation and treatment shall be borne by the owners of the animals and if advanced by the inspector or other

authorized person shall, until paid, be a charge upon the said animals without prejudice, however, to the recovery of any penalty for the infringement of these regulations.

9. If such expenses are not paid within twenty days of the time when they have been incurred the inspector or other duly authorized person may proceed to sell the said animals by public auction after giving to the owner ten days notice in writing of such intention to sell, which notice may be effectually given, where the owner is known, by delivering the same to him personally or by sending it by mail addressed to him at his last known place of residence. Where the owner is unknown such notice may be effectually given by publication in one issue of a newspaper published or circulating in the district where such animals are detained. The proceeds of such sale shall be applied first in payment of the reasonable expenses of the collection, isolation, treatment, giving of notice and conduct of sale and the balance, if any, shall be paid to the owner of said animals on demand. Any balance not so paid shall be remitted to the Minister, and if not claimed within twelve months from the date of sale shall be paid to the credit of the Receiver General.

10. No animal shall be removed out of an infected place without a license signed by an inspector or other duly authorized person.

11. Every yard, stable, outhouse or other place or premises and every wagon, cart, carriage, car or other vehicle, and every vessel and every utensil or other thing infected with mange shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to a veterinary inspector or other duly authorized person.

12. The Veterinary Director General may from time to time order the slaughter or other disposition of animals which are affected with or have been exposed to mange.

13. Every person who violates any provision of these regulations and every person who refuses or neglects to carry out any order of an inspector or other duly authorized person shall, for every such offence, incur a penalty not exceeding two hundred dollars.

JOHN J. McGEE,
Clerk of the Privy Council.

DOMINION OF CANADA.

ORDER OF THE MINISTER OF AGRICULTURE RELATING TO MANGE.

Under and by virtue of the powers vested in me by the Animal Contagious Diseases Act, 1903—

(1.) I do hereby declare that the disease of mange exists among horses throughout that portion of the territories of Assiniboia and Alberta which is bounded and described as follows:—

Commencing at the source of the Red Deer river, in Alberta, thence following the centre line of the stream of the said river and the various windings thereof to a point where the said line intersects the fourth meridian, thence along the line of the fourth meridian southerly to the intersection thereof with the International boundary between Canada and the United States, thence westerly along the International boundary line to a point where the same intersects the western boundary of Alberta, thence northerly and along the western boundary of Alberta to a point therein due west of the point of beginning thence in a straight line to the source of the Red Deer river and the point of beginning.

(2.) I do hereby further declare that all horses which are now or shall hereafter come within the limits of the said tract shall be considered to have been exposed to the contagion of mange, and the said tract is declared to be an infected place within the meaning of the Animal Contagious Diseases Act, 1903.

(3.) And I do hereby order as follows: No horse, except as hereinafter provided shall be removed or allowed to more out of the said tract unless and until it has been examined by a veterinary inspector of the department and certified to be free from the contagion of mange.

(4.) All horses which are intended to be removed or to be allowed to move out of the hereinbefore described tract except as hereinafter provided, shall be inspected, and if necessary, detained, dipped, sprayed or otherwise treated at such point or points as the Veterinary Director General may designate and shall be accompanied by the certificate of an inspector stating that they are free from the contagion of mange.

(5.) Wherever mange is discovered among a band of horses intended to be moved out of the said tract, the affected animals shall be separated from those not visibly affected and shall be detained, segregated and treated to the satisfaction of the inspector until cured and free from the contagion of mange. Those not visibly affected with mange shall be dipped or otherwise treated to the satisfaction of the inspector, before being allowed to proceed to their destination.

(6.) No railway company shall accept or load any shipment of horses at any point within the said tract unless such shipment is accompanied by the certificate of an inspector as aforesaid.

(7.) At whatever point horses originating in the said tract are unloaded they must be placed in special yards, and such yards shall be cleansed and disinfected immediately after having been occupied by such horses.

(8.) All cars and other vehicles and the chutes, alleyways, pens, yards and corrals used during transportation of such horses and at points of destination shall be cleansed and disinfected to the satisfaction of an inspector.

(9.) All way bills and bills of lading accompanying shipments of horses originating within the said tract shall have plainly written or stamped across the face thereof, a notification that the said cars are to be cleansed and disinfected immediately after being unloaded.

(10.) The transit of horses through the said tract is hereby permitted subject to the following regulations:—

Horses for transit by rail through the said tract from one part of Canada to another shall at points where unloading is necessary be placed in yards reserved for their exclusive use, and shall not be permitted to come in contact with horses, which have originated within the said tract.

(11.) Horses imported from the United States into the said tract destined for points in Canada outside thereof may upon compliance with the quarantine regulations and with the provisions of the next preceding section hereof, be permitted to pass without unnecessary delay through the said tract direct to their destination, without further restrictions.

All persons engaged in breeding, importing, dealing in, driving or shipping horses, and all transportation companies, are requested to co-operate with this department in enforcing the provisions of this order.

GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

Dated at Ottawa, June 21, 1904.

DOMINION OF CANADA.

Order of the Minister of Agriculture relating to Cattle Mange.

Whereas the disease of mange exists among cattle throughout those portions of the territories of Assiniboia and Alberta which may be described as bounded by the International boundary, the Rocky Mountains and a line drawn as follows:—

The line between townships 32 and 33 from the Rocky Mountains as far east as the line of the Calgary and Edmonton Railway, thence north-easterly along the said line of railway to its intersection with the line between townships 36 and 37, thence east along that line to the line between ranges 24 and 25 west of the 4th principal meridian, thence north along that line to the line between townships 38 and 39, thence east along that line to the 4th principal meridian, thence south along the 4th principal meridian to the line between townships 28 and 29, thence east along that line to the line between ranges 7 and 8 west of the 3rd principal meridian, thence south along that line to the line between townships 10 and 11, thence east along that line to the line between ranges 20 and 21 west of the 2nd principal meridian, thence south along that line to the International boundary line.

Therefore under and by virtue of the powers vested in me by the Animal Contagious Diseases Act, 1903, I do hereby declare the said tract to be an infected place.

And whereas it is of the greatest importance to the interests of stock-owners and to the preservation of a profitable market for western cattle that immediate steps should be taken with a view to the eradication of the disease in question and the prevention of its spread throughout Canada.

And whereas it is deemed necessary for the purpose aforesaid to supplement the provisions of the Order in Council dated June 27, 1904, whereby it is in part provided as follows:—

'Every veterinary inspector, and every person duly authorized by a veterinary inspector shall have full power to order animals affected or suspected of being affected with mange to be collected for inspection, and when necessary, to be detained, isolated or treated in accordance with the instructions of the Veterinary Director General.

'The expenses of and incidental to such collection, isolation and treatment shall be borne by the owners of the animals and if advanced by the inspector or other authorized person shall, until paid, be a charge upon the said animals, without prejudice, however, to the recovery of any penalty for the infringement of these regulations.

'If such expenses are not paid within twenty days of the time when they have been incurred, the inspector or other duly authorized person may proceed to sell the said animals by public auction after giving to the owner ten days' notice in writing of such intention to sell, which notice may be effectively given, where the owner is known, by delivering the same to him personally or by sending it by mail addressed to him at his last known place of residence. Where the owner is unknown, such notice may be effectively given by publication in one issue of a newspaper published or circulating in the district where such animals are detained. The proceeds of such sale shall be applied first to payment of the reasonable expenses of the collection, isolation, treatment, giving of notice and conduct of sale, and the balance, if any, shall be paid to the owner of said animals on demand. Any balance not so paid shall be remitted to the Minister, and if not claimed within twelve months from the date of sale shall be paid to the credit of the Receiver General.'

And whereas, the nature of the disease and the conditions under which cattle are kept in the above described tract are such that treatment, to be successful must be

general and, as nearly as may be, simultaneous, and must include not only cattle actually diseased, but all cattle which may have been, directly or indirectly, exposed to contagion.

And whereas, after careful inquiry and due consideration, it has been decided that the period between September 1 and October 31 is the most suitable and convenient for such treatment:—

Therefore I do hereby notify all persons owning or being in charge of cattle within the above described tract that they must, during the said period, dip or otherwise treat such cattle in a manner satisfactory to the officers of this department.

Provided that where it can be clearly shown to the satisfaction of the said officers that the cattle in any well defined area or district within the said tract are not affected with and have not been in any way exposed to the contagion of mange or that they have, during the present season, been treated in a satisfactory manner and subsequently kept completely isolated from all other cattle, the facts shall be reported to the Veterinary Director General who may exempt such area or district from the operation of this order so far as it applies to treatment.

Treatment satisfactory to the department shall comprise either:—

(1.) Immersion for not less than two minutes in a solution of lime and sulphur of a strength of not less than 10 pounds of lime and 24 pounds of sulphur to 100 gallons of water prepared according to the directions of the officers of the department. Or

(2.) An application by hand of the following preparation:—

Sulphur	2 pounds.
Oil of tar	8 ounces.
Raw linseed oil	1 gallon.

In either case, the fluid used shall be applied at a temperature of not less than 100 nor more than 110 degrees Fahrenheit, and the treatment shall be repeated after an interval of not less than ten nor more than fifteen days.

The amount charged for the treatment of stray cattle or of cattle whose owners neglect or refuse to comply with this order so far as it refers to treatment, shall in no case exceed twenty-five cents per animal for each dipping or application, provided that where it is necessary to collect such animals and to hold them for the second dipping or application, an additional sum of one dollar per animal may be collected.

2. No cattle shall be removed or be allowed to move out of the hereinbefore described tract unless they are accompanied by the certificate of an inspector of this department stating they have been examined by him and found free from contagion of mange. Any such cattle, however, shall, if deemed advisable by the inspector, be detained, dipped, sprayed or otherwise treated in such a manner as the Veterinary Director General may, from time to time, prescribe.

3. No railway company shall accept or load any shipment of cattle at any point within the said tract except for immediate slaughter as provided in section 7, unless such shipment is accompanied by the certificate of an inspector as aforesaid.

4. At points where cattle originating in the said tract are unloaded they shall be placed in special yards, and such yards shall be used for no other purpose and shall be cleansed and disinfected when so ordered by an inspector.

5. All cars and other vehicles used for the carriage of such cattle shall be cleansed and disinfected to the satisfaction of an inspector as soon as possible, after being unloaded and before being used for any other shipment.

6. All way bills and bills of lading accompanying shipments of cattle originating within the said tract shall have plainly written or stamped across the face thereof a notification that the said cars are to be cleansed and disinfected immediately after being unloaded.

7. Cattle affected with or which have been exposed to the contagion of mange may be shipped for immediate slaughter to points within the above described tract under the following conditions:—

(1.) They shall be loaded from special yards and chutes reserved exclusively for such shipments; shall not be allowed to come in contact with other animals; shall be consigned direct only to such slaughter houses within the hereinbefore described tract as are provided with private yards and chutes; shall not be unloaded at any point en route and shall under no pretext whatever be removed alive from the slaughter house or the yards and premises immediately connected therewith.

(2.) Cars conveying such cattle shall be cleansed and disinfected to the satisfaction of an inspector immediately after being unloaded.

8. The transit of cattle through the said tract is hereby permitted subject to the following regulations:—

(1.) Cattle for transit by rail through the said tract from one part of Canada to another shall, at points where unloading is necessary, be placed in yards reserved for their exclusive use, and shall not be permitted to come in contact with cattle which have originated within the said tract.

(2.) Cattle imported from the United States into the said tract destined for points in Canada outside thereof may, upon compliance with the quarantine regulations, and with the provisions of the next preceding section thereof, be permitted to pass without unnecessary delay through the said tract direct to their destination without further restrictions.

All persons engaged in breeding, exporting, dealing in, driving or shipping cattle and all transportation companies are requested to co-operate with this department in enforcing the provisions of this order.

GEO. F. O'HALLORAN,
Deputy Minister of Agriculture.

Dated at Ottawa, August 9, 1904.

DOMINION OF CANADA.

REGULATIONS RELATING TO GLANDERS.

By Order in Council dated September 19, 1904, in Virtue of 'The Animal Contagious Diseases Act, 1903.'

1. Every owner, breeder or importer of or dealer in animals shall on perceiving the appearance of glanders among the horses, mules and asses owned by him or under his special care, give immediate notice to the Minister of Agriculture and to the nearest veterinary inspector of the Department of Agriculture of the facts discovered by him as aforesaid.

2. Every veterinary surgeon practising in Canada shall, immediately on ascertaining or suspecting that an animal is affected with glanders, give similar notice to the Minister and to the nearest veterinary inspector.

3. In the Northwest Territories the notice required to be given by the two preceding sections of these regulations shall be deemed sufficient if given to the Commissioner, Assistant Commissioner, or other officer of the Royal Northwest Mounted Police, or to one of the veterinary staff sergeants of the said force.

4. Horses, mules and asses showing at any time whatever clinical symptoms of glanders, shall on an order signed by a duly appointed inspector of the Department of Agriculture be forthwith slaughtered and the carcases disposed of as in such order prescribed.

5. No animal which is affected with or has been exposed to glanders shall be permitted to run at large or to come in contact with any animal which is not so affected.

6. Any veterinary inspector or other duly authorized person may declare to be an infected place within the meaning of 'The Animal Contagious Diseases Act, 1903,' any common, field, stable, cowshed, or other place or premises where the contagion of glanders is known or suspected to exist.

7. No horse, mule or ass shall be removed out of an infected place without a license signed by an inspector or other duly authorized person.

8. Veterinary inspectors are hereby authorized to inspect and to subject to the mallein test any horses, mules and asses affected with glanders or suspected of being so affected or which have been in contact with animals so affected or suspected of being so affected, or which have been in any way whatsoever exposed to the contagion or infection of the disease of glanders, and for the purpose of making such inspection or test to order any such animals to be collected, detained and isolated.

9. Inspectors are hereby authorized to order the slaughter of horses, mules, and asses which react to the mallein test, but do not show clinical symptoms of glanders and to order the disposition of the carcases of such animals, and the Minister of Agriculture is hereby authorized to order compensation to be paid to the owners of such animals at the rate set forth in subsection 2 of section 12 of 'The Animal Contagious Diseases Act, 1903,' as amended by chapter 6 of the Statutes of 1904.

10. Inspectors are hereby further authorized, should the owners prefer it, to order that horses, mules and asses which react to the mallein test but do not show clinical symptoms of glanders, be isolated and subjected to a second and third test with mallein, such second and third tests to be made at the expense of the owner, and to be completed within four months of the first test. Provided, however, that any animal which shows clinical symptoms of glanders at any time during the period between the first and third tests shall be slaughtered without compensation.

11. Horses, mules and asses reacting to the third test with mallein, shall be forthwith slaughtered on an order signed by an inspector and the carcases disposed of as ordered and the Minister may order compensation at the rate aforesaid to be paid to the owners for any of the said animals which have at no time shown clinical symptoms of glanders.

12. Inspectors are hereby authorized to permit owners of horses, mules and asses which give no reaction to the third test with mallein, and which have at no time shown any clinical symptoms of glanders, to retain and use such animals subject to the conditions contained in the order or notice signed by the inspector.

13. Before ordering compensation to be paid in any of the cases aforesaid the Minister shall require the production of a satisfactory report, order for slaughter, certificate of valuation and slaughter, and certificate of cleansing and disinfection, all signed by an inspector.

14. The certificate of an inspector to the effect that an animal has reacted to the mallein test or has shown clinical symptoms of glanders shall, for the purposes of the said Act and of this Order, be prima facie evidence in all courts of justice and elsewhere of the matter certified.

15. Every yard, stable, outhouse or other place or premises and every wagon, cart, carriage, car or other vehicle, and every utensil or other thing infected with glanders, shall be thoroughly cleansed and disinfected by and at the expense of the owner or occupier in a manner satisfactory to a veterinary inspector or other duly authorized person.

J. G. RUTHERFORD,
Veterinary Director General.

Department of Agriculture,
Ottawa.

CANADIAN REGULATIONS RELATING TO ANIMALS' QUARANTINE.

ORDER IN COUNCIL CONTAINING REGULATIONS RELATING TO ANIMALS' QUARANTINE.

AT THE GOVERNMENT HOUSE AT OTTAWA.

The 30th day of March, 1904.

PRESENT:

HIS EXCELLENCY THE GOVERNOR GENERAL IN COUNCIL.

Whereas it is deemed desirable and necessary that the present Cattle Quarantine Regulations should be amended owing to the repealing of Chapter 69 of the Revised Statutes of Canada, and Chapter 13 of the Statutes of 1896.

Therefore, the Governor General in Council, in virtue of the provisions of Chapter 11, of 3 Edward VII, intituled 'An Act respecting Infectious or Contagious Diseases affecting Animals,' is pleased to order that the Order in Council dated 25th January, 1897, establishing regulations relating to Animals' Quarantine and Health of Animals, shall be and the same is hereby rescinded and the annexed regulations substituted therefor.

(Signed) JOHN J. McGEE,
Clerk of the Privy Council.

The Honourable
The Minister of Agriculture.

HEALTH OF ANIMALS BRANCH.

QUARANTINE REGULATIONS.

Interpretation.

Sec. 1. In these Regulations, unless the context otherwise requires:—
(a) The expression 'the Minister' means the Minister of Agriculture:
(b) The expression 'inspection' means an inspection made by a duly authorized Veterinary Inspector of the Department of Agriculture;
(c) The expression 'contagious' means communicable by close contact or inoculation;
(d) The expression 'infectious' means communicable in any manner;
(e) The expression 'infectious or contagious disease' includes, in addition to other diseases generally so designated, glanders, farcy, pleuro-pneumonia contagiosa, foot and mouth disease, rinderpest, anthrax, Texas fever, hog cholera, swine plague, mange, scab, rabies, tuberculosis, actinomycosis and variola ovina.

Sec. 2. The Veterinary Director General is in charge of the Health of Animals Branch of the Department of Agriculture.

Sec. 3. The following Customs ports are hereby declared to be Animals' Quarantine Stations and all animals imported into Canada subject to quarantine must be entered through said Stations, viz.:—Halifax, N.S., St. John, N.B., Charlottetown, P.E.I., Quebec, Sherbrooke and St. Johns, Que., Niagara Falls, Windsor and Sarnia, Ont., Emerson, Man., North Portal, Wood Mountain, Pendant d'Oreille, Coutts and Cardston, N.W.T., Gateway, Rossland, Nelson, Grand Forks, Vancouver, and Victoria, B.C.

Sec. 4. Animals subject to inspection only, but which are not subject to quarantine, may enter through the aforesaid and at the following ports:—Pictou, North Sydney and Yarmouth, N.S., St. Stephens, Woodstock and McAdam Junction, N.B., Comin's Mills, Lake Megantic, Coaticook, Stanstead Junction, Mansonville, Abercorn, St. Armand, Rouse's Point, Athelstan and Dundee, Que., Cornwall, Prescott, Brockville, Toronto, Bridgeburg, Sault Ste. Marie and Port Arthur, Ont., Gretna, Morden, Mowbray, Crystal City, Killarney, Déloraine, Melita and Winnipeg, Man., Rykerts, Waneta, Midway, Sidley, Sumas, New Westminster, Douglas and Nanaimo, B.C.

IMPORTATION.

Sec. 5. (*a*) Persons contemplating the importation of animals from any part of the world, except the United States, must first obtain from the Minister a permit stating the number and kind of animals to be imported, the country of origin and probable date of shipment, the port at which said animals are to be landed and the approximate date of their arrival, and such permit shall not be available at any port other than the one mentioned therein.

(*b*) Application for such permits shall be in writing and the statements in such applications may be required to be verified on oath and the Minister shall decide in every case, whether a permit will be granted.

(*c*) Animals from countries other than the United States arriving at any port in Canada without such permit shall not be admitted to Canada unless and until ordered by the Minister.

Sec. 6. The importation into Canada of animals from all countries, other than the United States and Mexico, is prohibited except at the ports of Victoria, Vancouver, Quebec, Halifax, St. John, N.B., Charlottetown, P.E.I., and such other ports as may hereafter be indicated by the Minister.

Sec. 7. Persons in charge of vessels conveying animals to Canada must, immediately on arrival in port, notify the Superintendent of the Animals' Quarantine Station of the arrival of such vessel and the number and kind of animals on board thereof.

Sec. 8. All importers must certify under oath, before making customs entry, the place of origin of the animals imported by them.

Sec. 9. All animals arriving in Canada through any of the above mentioned ports on the Canadian sea-board shall be subject to inspection on arrival by inspectors who may, from time to time, be appointed for that purpose.

Sec. 10. All inspections of imported animals must be made in daylight.

Sec. 11. Inspectors shall have free access to any wharf, vessel, car, or to any place where animals may be found, and, under authority from the Minister, shall deal with animals, vehicles and other articles in the manner contemplated by the Animal Contagious Diseases Act, 1903.

Sec. 12. Inspectors shall visit the vessels or cars conveying animals into the said ports, and after inspecting such animals and finding them free from disease, shall superintend their landing or unloading, order them to be placed and disposed of according to the requirements of the case, and see that those to be quarantined are conveyed to the proper quarantine station. Inspectors shall also superintend the landing, unloading and disposal of fodder, litter, blankets, troughs and other articles which may have been used by or for the said animals.

Sec. 13. Inspectors may, if they deem it necessary, order the cleansing and purifying of any vessel, place, vehicle, building or article, and direct such precautionary measures to be taken as they may consider advisable pending the decision of the Minister as to the ultimate disposal of such vessel, place, vehicle, building or article.

CATTLE.

Sec. 14. (*a*) A quarantine of sixty days shall be enforced upon all cattle imported from Great Britain, Ireland or the Channel Islands. A quarantine of ninety days shall be enforced upon all cattle imported from all other countries except the United States and Mexico.

(*b*) The period of quarantine enforced upon cattle shall be counted from the date of clearance of the vessel carrying the same.

Sec. 15. All importers or their agents, before embarking animals, other than horses, for Canada, must obtain a certificate from a properly constituted authority that the place from which such animals come is free from pleuro-pneumonia contagiosa, rinderpest or foot and mouth disease.

OTHER RUMINANTS.

Sec. 16. A quarantine of fifteen days to be reckoned from the day of landing, shall be enforced upon all sheep and goats imported from countries other than the United States.

SWINE.

Sec. 17. A quarantine of fifteen days to be reckoned from the day of landing, shall be enforced upon all swine imported, except from the United States, for immediate slaughter.

Sec. 18. The minister may prohibit the importation of animals, other than horses, from any country or any district therein where he has reason to believe that pleuro-pneumonia contagiosa, rinderpest or foot and mouth disease exist.

HORSES.

Sec. 19. Horses imported from countries other than the United States, consigned to Montreal, must be, if the Minister so directs, inspected at the port of Quebec during summer navigation; in absence of special direction of the Minister, they may be inspected at the port of Montreal. Horses landing at any of the other ports named shall be inspected at such ports.

Sec. 20. Horses imported from countries other than the United States must be accompanied by the certificate of a qualified veterinarian and of the local authority of the district whence they came that no glanders, 'maladie du coït,' or other serious infectious or contagious disease has existed in said district for a period of six months prior to their shipment.

Sec. 21. Importers of horses will be required to certify under oath that the certificate produced applies to the horse or horses which it purports to describe and to no other, and that the district named is the actual one from which said horse or horses came. Any attempt at evasion or misrepresentation will be deemed a breach of these regulations and in addition will render the shipment liable to seizure and detention pending the orders of the Minister as to its disposal.

REGULATIONS OF QUARANTINE.

Sec. 22. Quarantine stations shall be under the care and subject to the orders of the officers appointed for that purpose hereinafter referred to as superintendents, who shall have the general superintendence and control of the servants or other persons, and of all other matters connected therewith.

Sec. 23. Animals in any quarantine station shall be treated and dealt with under the direction of the superintendent of said station, and all articles used for, about or in connection with the said animals shall be in like manner subject to his direction and supervision.

Sec. 24. Cattle six months old or over imported from countries other than the United States and Mexico shall not be discharged from quarantine until they have been submitted to the tuberculin test by the superintendent of the quarantine or other duly authorized officer.

Sec. 25. Cattle reacting to the tuberculin test, but not showing clinical symptoms, shall be permanently marked in the right ear with the letter 'T' by the officer making the test, and may then be released at the expiry of the prescribed period of quarantine if found free from all other infectious or contagious diseases.

Sec. 26. Cattle showing clinical symptoms of tuberculosis shall be destroyed or otherwise disposed of as the Minister may direct.

Sec. 27. The Minister or the Veterinary Director General may authorize the destruction of any quarantined animals or all or any portion of the articles used in the care of the said animals, and such destruction shall take place under the supervision of the superintendent, and in the manner prescribed by him.

Sec. 28. The expense of feeding, treating and providing for animals detained in quarantine, with the exception of those for the use of grounds and shelters, shall be borne by the owner or importer, and such expenses shall be paid before the animals are permitted to leave the quarantine, and in default of such payment within fourteen days after the expiration of the period of quarantine, the Superintendent may, on fourteen days' notice in writing, delivered or sent by mail to the owner or importer, cause the said animals to be sold to meet the said expenses, together with the expenses of and incidental to the sale of the said animals, the balance, if any to be handed over to the owner.

Sec. 29. No animal under quarantine shall be allowed to come in contact with any Canadian animal until duly discharged from quarantine.

Sec. 30. No animal under quarantine shall be removed from a quarantine station until duly discharged therefrom by the superintendent or other duly authorized officers.

Sec. 31. Any person removing or attempting to remove any animal from a quarantine station without the authority of the Superintendent, or other duly authorized officer, shall incur a penalty not exceeding $200 for every such offence.

IMPORTATION OF ANIMALS FROM THE UNITED STATES.

Sec. 32. All animals imported into the Dominion of Canada from the United States must be accompanied by a statutory declaration or affidavit made by the owner or importer stating clearly the purpose for which said animals are imported, viz:—whether for breeding purposes, for milk production, for work, for grazing, feeding or slaughter, or whether they form part of settlers' effects, or whether they are entered for temporary stay, as provided by these regulations.

Sec. 33. Said declaration or affidavit must be presented to the Collector of Customs at the port of entry, who will decide whether the animals are entitled to entry under these regulations, and who will notify the Veterinary Inspector of the Department of Agriculture in all classes where the regulations require an inspection to be made.

HORSES, MULES AND ASSES.

Sec. 34. Unless otherwise ordered by the Minister, horses, mules and asses may be admitted at any Customs port.

Sec. 35. The Minister may from time to time, order that any horses, mules or asses may be admitted at such points only as the order may designate and subject to such regulations as to inspection, detention, quarantine, submission to the mallein test, dipping or other treatment as the order may provide.

Sec. 36. Horses, mules and asses found to be diseased may be returned to the United States or otherwise dealt with as the Veterinary Director General may order.

CATTLE.

Sec. 37. All cattle shall be inspected and should, when possible, be accompanied by a certificate signed by a veterinarian of the United States Bureau of Animal Industry or by a State Veterinarian, stating that no contagious disease of cattle (excepting tuberculosis and actinomycosis) has existed in the district whence they have come, during the period of six months immediately preceding the date of their removal therefrom.

Sec. 38. Any cattle may be detained, isolated, submitted to the tuberculin test, dipped or otherwise treated, if so ordered by the Minister, or, in default of such order, where the inspector has reason to believe or suspect that animals are affected with or have been exposed to contagious or infectious disease.

Sec. 39. Cattle found to be diseased may be returned to the United States or otherwise dealt with as the Veterinary Director General may order.

Sec. 40. Cattle for breeding purposes and milk production six months old or over, if unaccompanied by a satisfactory tuberculin test chart signed by a veterinarian of the United States Bureau of Animal Industry, must be detained in quarantine for one week or such further period as may be deemed necessary and subjected to the tuberculin test ; cattle reacting thereto must be returned to the United States or slaughtered without compensation.

Sec. 41. Importers may be required to furnish a statutory declaration that the chart produced applies to the cattle it purports to describe and no other.

SHEEP.

Sec. 42. All sheep shall be inspected, and should, when possible, be accompanied by a certificate signed by a veterinarian of the United State Bureau of Animal Industry, or by a state veterinarian, stating that no contagious disease of sheep has existed in the district whence they have come, during the period of six months immediately preceding the date of their removal therefrom.

Sec. 43. Any sheep may be detained, isolated, dipped or otherwise treated, if so ordered by the Minister, or, in default of such order, where the inspector has reason to believe or suspect that the animals are affected with or have been exposed to contagious or infectious diseases.

Sec. 44. Sheep found to be diseased may be returned to the United States or otherwise dealt with as the Veterinary Director General may order.

The above regulations, sections 42 to 44 are also applicable to goats.

SWINE.

Sec. 45. All swine shall be inspected and on and after May 1, 1904, a quarantine of fifteen days shall be enforced upon all swine except those imported for immediate slaughter.

Sec. 46. All swine imported into Canada, except for slaughter, must be accompanied by a certificate signed by a veterinarian of the United States Bureau of Animal Industry, or by a duly authorized state veterinarian, stating that neither swine plague nor hog cholera has existed within a radius of five miles of the premises in which they have been kept for six months immediately preceding the date of shipment.

Sec. 47. Swine imported for slaughter must be consigned direct to a bonding warehouse, a slaughter house or packing house, must not be removed therefrom alive, and must be slaughtered within ten days after their arrival in Canada.

Sec. 48. Swine found to be suffering from contagious disease will be subject to slaughter without compensation.

Sec. 49. Live swine imported for slaughter and swine carcasses introduced for curing and packing shall not be permitted to come in contact with Canadian animals.

Sec. 50. The cars, trucks and other vehicles employed in such traffic shall not be used for the transport of Canadian animals but shall be immediately sealed and returned to the United States.

Sec. 51. The bonding places and warehouses used for such swine are hereby declared to be infected places, subject to such regulations as the Minister may see fit to adopt for the purpose of preventing the introduction of disease among the live stock of the country.

Sec. 52. The transport of the swine imported for slaughter and of the carcasses imported to be cured and packed, the disposal of all offal, manure and debris and every proceeding in relation to the said traffic shall be subject to inspection and regulation in accordance with the meaning of 'this Order' under the direction of the Minister.

ANIMALS FOR EXHIBITION.

Sec. 53. Animals other than swine may be admitted for purposes of exhibition only, on inspection at port of entry, subject to the usual customs regulations.

IMPORTATION OF ANIMALS FROM MEXICO.

Sec. 54. Any person contemplating the importation of animals from Mexico must, in addition to all other requirements of this order, first obtain from the Minister a permit stating the number and kind of animals to be imported, the district and state in Mexico whence they are to be shipped and the probable date of their arrival at the Canadian port of entry. The person applying for such permit shall furnish satisfactory proof of the facts hereinbefore set forth.

ANIMALS IN BOND.

Sec. 55. Animals passing in bond through United States territory for importation to Canada must be accompanied by a certificate of health signed by a veterinarian of the United States Bureau of Animal Industry and by an affidavit from the owner or importer that the said certificate refers to the animals in question. Such animals shall nevertheless be subject to inspection and if necessary, to detention before being permitted to enter Canadian territory. If found diseased such animals are to be subject to and dealt with according to the orders of the inspecting officer under instructions from the Veterinary Director General.

The expense of treatment, should such be deemed advisable, must be borne by the owner or importer of the animals treated.

Sec. 56. Animals may be admitted from any part of the United States into Canada for transit to any other part of the United States in bond, and (with the exception of swine) will be admitted to Canada in bond for transit to any Canadian

port for exportation by sea to Europe or elsewhere. Such animals are to be subject to inspection at the Canadian port of shipment.

Sec. 57. The transit of such animals shall be subject to such regulations as the minister shall, from time to time, prescribe.

EXPORTATION.

Sec. 58. Canadian animals for transit to any shipping port of the United States for export by sea to Europe or elsewhere must be inspected at such places in Canada as the minister may, from time to time, designate ; must not be shipped from the place of inspection until they have been certified by a duly authorized veterinary inspector to be free from infectious and contagious disease and otherwise fit for export, and must not be permitted by collectors of customs to leave Canada unless accompanied by such certificate.

Sec. 59. Animals for exportation by sea should, if possible, reach the port of exportation not less than twelve hours before shipment for rest and inspection. Animals failing to do so shall be liable to detention in the discretion of the inspector.

Sec. 60. Inspectors shall at all times have full power to detain animals for such time as they consider sufficient to enable them to make a thorough and satisfactory inspection and to ascertain that all the provisions of these regulations relating thereto have been duly observed and complied with.

Sec. 61. Owners or persons in charge of animals for exportation shall give twenty-four hours notice, addressed to the inspector at his office, stating the number and kind of such animals and the expected time of their arrival at the port of exportation.

Sec. 62. No animals shall be permitted to be placed on board any steamship or other vessel for exportation at any Canadian port until they have been inspected and approved by a duly authorized veterinary inspector at such port, and certified by him to be free from contagious disease and in every way fit for export ; such inspection to be made within twenty-four hours of embarkation.

Sec. 63. Inspectors shall, in the performance of their duties, have free access to any ship, car or other vehicle and to any yard, stable or place where animals may be found.

Sec. 64. All inspections for export must be made in daylight.

Sec. 65. Owners or shippers of stock during the progress of inspection at any port of exportation shall, with the means at their disposal, give every required assistance to the inspector at such port, and move the animals according to his directions. In case the owner or shipper refuses or neglects to furnish the necessary assisstance, the inspector may employ men at the cost of the owner or shipper, and such cost shall be paid to the inspector before a clean bill of health is given.

Sec. 66. Inspectors will mark each animal inspected by them and no animals shall be embarked without such mark. A certificate of inspection stating the name of the owner, the number, sex and class of animals in the consignment and certifying to their freedom from contagious disease, will be furnished by the inspector and must be produced to the collector of customs before embarkation.

Sec. 67. Such animals as may be found to have been exposed to contagious or infectious disease, or to be affected with contagious or infectious disease, shall be detained and dealt with according to the orders of the inspecting officer under instructions from the Veterinary Director General.

Sec. 68. Inspectors may reject animals for any reasonable cause.

Sec. 69. The Collector of Customs of any port in Canada whence animals are exported shall not give a clearance to any ship having animals on board for exportation without having produced to him a certificate, signed by the inspector, to the effect that the regulations relating thereto as hereinbefore set forth have been duly observed and complied with.

INFECTED VESSELS.

Sec. 70. Vessels which have carried cattle, sheep or other ruminants, among any of which 'Foot and Mouth Disease' shall have been found, shall be prohibited, for a period of sixty days thereafter, from loading cattle, sheep or other ruminants or swine, in any Canadian port : and, further, until such vessels shall have been thoroughly cleansed and disinfected, under the supervision of an inspector or other duly authorized officer.

HEAD-ROPES.

Sec. 71. The importation of head-ropes which have been used for tying up cattle is prohibited, and all vessels carrying or having on board such head-ropes in contravention of this regulation shall be liable to be declared to be infected under 'The Animal Contagious Diseases Act, 1903.'

CUSTOMS OFFICERS.

Sec. 72. Collectors of Customs throughout Canada shall see that the various exigencies and requirements of the present order are fulfilled before granting any permit which requires, before it is given, any act to be performed, or any inspection or other proceeding to be made or taken, and they shall see that the prohibitions prescribed and rules established by this order as hereinbefore mentioned, and the instructions which may be issued by the Minister are obeyed, and in case of any infraction of the provisions of the present order, or any of them, taking place, they shall report at once to the Minister the nature and extent of such infraction.

GENERAL PROVISIONS.

Sec. 73. To provide against the possibility of diseased animals being carried from place to place, through Canadian Territory, or conveyed to and shipped from ports, it is ordered as follows :—

An inspection of animals may be made at any place or time under authority from the Minister.

Sec. 74. Inspectors shall, in making such inspection, have free access to any vessel, car, yard, stable, shed or place which they may deem it necessary to enter.

Sec. 75. Such animals as may be found affected with or having been exposed to contagious or infectious disease, shall be dealt with according to the provisions of the 'Animal Contagious Diseases Act, 1903.'

Sec. 76. On infectious or contagious disease of animals being discovreed on board any steamship, vessel or car, or in any stable, shed, yard or other place, it shall be the duty of the inspector, on the removal of the infected animal or animals, to superintend the thorough disinfection of such steamship, car, stable, shed, yard or other place, without loss of time, in the manner prescribed under the general regulations for disinfection of premises.

Sec. 77. All yards, stables, sheds or other premises used (by railway or steamship companies or other persons) for the accommodation of animals, shall be maintained in a clean, comfortable and sanitary condition and shall be subject at all times to inspection by inspectors acting under the authority of the Minister, who, when they deem such action necessary, may order the cleansing and disinfection in a satisfactory manner of the said yards, stables, sheds, or other premises, as provided in the 'Animal Contagious Diseases Act., 1903.'

Sec. 78. In the event of any owner, lessee or occupant of any yard, stable, shed or other premises (or any railway or steamship company or person) refusing or neglecting to carry out the orders of the inspector in regard to cleansing and disinfection as aforesaid, or in the event of such owner, lessee or occupant, company or person neglecting to maintain his or its yards, stables, sheds or other premises for the use of animals, in a clean, comfortable and sanitary condition, the inspector may condemn the said premises as unfit for use, whereupon the said premises shall not be used for the accommodation of animals until such time as the orders of the inspector in regard thereto have been satisfactorily carried out.

Sec. 79. No animals are to be allowed to be placed on board cars till the litter from the previous load has been removed, and the car white-washed with lime and carbolic acid, in the proportion of 1 pound commercial carbolic acid to 5 gallons of lime wash.

Sec. 80. Shippers may refuse to place their animals on uncleaned cars, and may lodge a complaint with the nearest inspector, who shall either cause such cars to be cleansed and disinfected, as above, at the expense of the railway company, or shall prohibit their use until they have been so cleansed and disinfected.

Sec. 81. Any person who violates any provision of the 'Animal Contagious Diseases Act, 1903,' or any provision of this Order, shall incur the penalties prescribed by the said Act.

REGULATIONS.

RELATING TO IMPORTATION OF HORSES, MULES AND ASSES.

Notice is hereby given that under and by virtue of the powers vested in me by Order in Council, dated the 30th day of March, 1904, I do hereby order and declare that the following regulations relating to the importation into Canada of certain classes of horses, mules and asses are in full force and effect on and after the date hereof :—

1. Horses, mules and asses which have originated in or passed through the Republic of Mexico, or that portion of the United States lying west of the Mississippi River, and of the Eastern Boundary of the State of Minnesota, shall be inspected, and if gentle and thoroughly broken to harness or saddle may be admitted at any quarantine or inspection port, as follows :—

Quarantine Ports—Halifax, N.S.; St. John, N.B.; Charlottetown, P.E.I.; Quebec, Sherbrooke and St. Johns, Que.; Niagara Falls, Windsor and Sarnia, Ont.; Emerson, Man. ; North Portal, Wood Mountain, Pendant d'Oreille, Coutts and Cardston, N.W.T.; Gateway, Rossland, Nelson, Grand Forks, Vancouver and Victoria, B.C.

Inspection Ports—Pictou, North Sydney and Yarmouth, N.S.; St. Stephens, Woodstock and McAdam Junction, N.B.; Comin's Mills, Lake Megantic, Coaticook, Stanstead Junction, Mansonville, Abercorn, St. Armand, Rouse's Point, Athelstan and Dundee, Que.; Cornwall, Prescott, Brockville, Toronto, Bridgeburg, Sault Ste. Marie and Port Arthur, Ont. ; Gretna, Morden, Mowbray, Crystal City, Killarney, Deloraine, Melita and Winnipeg, Man.; Rykerts, Waneta, Midway, Sidley, Sumas, New Westminster, Douglas and Nanaimo, B.C.

2. Inspectors shall, however, in any case, have the power to detain, isolate, submit to the mallein test, dip or otherwise treat such horses, mules and asses as they may have reason to believe or suspect are affected with, or have been exposed to infectious or contagious disease.

3. Branded or range western horses, other than those which are gentle and thoroughly broken to harness or saddle, may be admitted only at the following ports :—

Sarnia, Ont.; Emerson, Man.; North Portal, Wood Mountain, Pendant d'Oreille, Coutts and Cardston, N.W.T.; Gateway, Rossland, Nelson, Grand Forks, Vancouver and Victoria, B.C., and subject to the following regulations :—

(*a*) Such horses must be accompanied by a certificate signed by a Veterinarian of the United States Bureau of Animal Industry, or by a State veterinarian, stating that they are free from infectious and contagious disease, and that no infectious or contagious disease of horses has existed in the district whence they have come, for the period of six months immediately preceding the date of their removal therefrom.

(*b*) Owners or persons in charge shall afford to Inspectors every facility and assistance for inspecting and otherwise dealing with such horses and shall secure and handle them as directed by the inspectors.

(*c*) Such horses shall, in all cases, be subject to detention for such period as the inspectors may deem necessary to determine, whether they are free from infectious and contagious disease. and shall be isolated, submitted to the mallein test, dipped or otherwise treated, if the inspector so orders.

SYDNEY FISHER,
Minister of Agriculture.

Department of Agriculture,
Ottawa, March 31st, 1904.

THE BREEDING OF REMOUNTS—AN ADDRESS DELIVERED AT THE OTTAWA FAT STOCK SHOW, MARCH, 1904.

The subject on which I have been asked to speak to you this morning, viz., the breeding of horses for army use, is one which, while perhaps not of paramount importance to Canadian stock men, is well worthy of consideration in a gathering such as this.

For many years past, this question has occupied the attention of Canadian horsemen to a greater or less extent and many efforts have been made, particularly by the residents of western Canada, to introduce the War Office to take steps in the direction of establishing remount stations in the Dominion.

As far back as 1886 a commission, consisting of Colonel Ravenhill of the Royal Artillery, and Colonel Phillips and Veterinary Surgeon Matthews of the Royal Horse Guards visited Canada and reported fully on the possibilities of the Dominion as a source for furnishing the then much needed remounts for military purposes. These gentlemen purchased a limited number of horses and by their representations, several breeders, particularly in Alberta, were led to invest largely in foundation stock with a view to furnishing the horses which it was supposed would be eagerly sought after and purchased by the army authorities. A considerable number of Thoroughbred stallions of the best and most fashionable blood in Britain and America were purchased and placed on the ranches, while one establishment went so far as to import 300 Irish mares with the view of producing high class military horses. No reward, however was vouchsafed to the enterprise thus displayed as not a single horse, so far as the speaker is aware, was purchased in Canada by the British War Office between 1886 and 1900, although a large number of magnificent animals were produced on the ranges above referred to. The North-west Mounted Police bought as many of the horses as were required in that service, while a considerable number of others were purchased from time to time, for the French, Belgian and Dutch armies, none, however, being asked for by the British War Office. As a result of this disappointment, the gentlemen who had gone into the project with energy and vigour, became disgusted and either abandoned horse breeding altogether or turned their attention to the production of animals suited for heavy draft or farm work.

The suitability of Canada as a breeding ground for remounts was repeatedly brought to the notice of the British government by western breeders as is shown by the correspondence which I had carefully reprinted a few years ago when I occupied the position of president of the Horse Breeders Association of Manitoba and the North-west Territories.

No encouragement was, however, given until the advent of General Hutton who took an active interest in the matter, and showed himself anxious to bring about a better understanding between the army authorities and the horse breeders of the Dominion.

The outbreak of the war in South Africa and the consequent keen demand for horses to be used on service was the means of again relegating to the back ground the project of establishing permanent remount depots in this country.

During the continuance of the war a large number of horses, many of them nondescripts, were purchased and the effect of this action, contrary to what might be generally imagined, was the confusing, to a large extent, of the public understanding as to the types of horses required for and purchased by the British Army authorities during times of peace. There is a great difference between the class of horses bought under ordinary circumstances and the animals which must be accepted during war, when the wastage of horse flesh is excessive and the demand far exceeds the supply.

Many horses were purchased by the army officers operating here during the South African campaign which would never be looked at in times of peace, and this fact must be borne clearly in mind by those listening to this paper and the discussion to which I hope it will give rise. As a striking proof of the truth of the statement which I have just made I may say that the Ravenhill Commission spent 167 days in Canada, travelled 14,755 miles, examined 7,674 horses of which, 1,025 were registered to be looked at a second time, with the significant result that they were only able to purchase for army purposes, 83 horses.

No objection was raised as to prices which were looked upon as very reasonable and moderate and it was not the question of money which prevented their purchasing in larger numbers. The reasons which prevented the purchase of more animals in 1886 were fully explained by the commissioners and I regret to have to say, still exist to a very large extent throughout the Dominion. These officers found that the majority of the horses which would otherwise have been suitable for military purposes were unsound or blemished, this being particularly due to the overworking of the horses when too young, resulting in permanent injury to their limbs and joints.

In the case of mares, this evil is perpetuated from generation to generation, while large numbers of faulty and unsound stallions, then as now, contributed largely to the evil.

Another objection to Canadian horses and which was by them attributed, I think, rightly to the too extensive and indiscriminate use of the American trotter for stud purposes, is the fact that they are not of saddle type, many of them having poor straight shoulders, a long back, and short and drooping hind quarters, the latter being a serious objection in the case of a mounted soldier carrying his kit behind the saddle.

It was stated then and I fear it is still too true, that it is the exception to meet with a Canadian horse having a lengthy rein and quarters, good withers and oblique shoulders, this type of horse being only procurable by a judicious mixture of Thoroughbred which has unfortunately, especially in recent years, been far from popular among the light horse breeders of the Dominion. The foregoing remarks are applicable to the majority of horses required for army use although the characteristics of military horses vary with the work which they are intended to perform.

Without again recounting all the arguments which have been repeatedly advanced as to the suitability of the climate and soil of Canada for the raising of all classes of horses, the advantage in time of stress of being able to purchase in a British colony when foreign markets might be closed against us and the convenience of shipping either

to the far east or to Europe, I now propose to give a brief description of the types of animals usually sought for and purchased for use in our military service as also a few hints as to how they may be most easily and certainly produced.

Three fairly distinct classes are comprised by the term army horse or 'remount' as he is technically styled. Of these the most important has hitherto been and still is the cavalry horse although the nature of modern warfare seems likely to relegate him ere long to a second or even a third place in the scale. This horse is of the distinctly riding type, that is to say, he must be well bred with clean head, lengthy rein, sloping shoulder, deep through the heart, well ribbed up with a strong short back, good loin, long straight quarters and tail well set on.

He must, when full grown, stand squarely and on short legs not less than 15—2 nor more than 16 hands, should girth six feet or more and measure not less than eight inches below the knee. He must be essentially a strong horse as the British cavalry trooper with his arms and kit, looking as Toomy Atkins says 'like a bloomin' Christmas tree on horse-back,' rides from 250 to 280 lbs. weight and his mount must be able to move freely under this killing load.

Such animals are not very plentiful in any country and in fact, are constantly growing more difficult to procure. They can best be obtained by the judicious use of selected T. B. sires on strong half-bred mares, on those having an admixture of hackney or coach blood, on strong roadster mares and in Canada on fair sized and symmetrical French mares. On light roadster mares showing a tendency to weediness, a hackney sire having plenty of quality may be used with advantage.

The artillery or army draft horse is of an entirely different type and is more easily picked up than the trooper. He may best be described in general, as an active quick moving vanner or expresser, the horse known in Glasgow as the 'Gyp,' having enough quality to stand hard, fast work with sufficient substance and strength to handle his share of a by no means light load. He should be a clean-legged solid horse with plenty of bone, able to trot out freely and above all to walk well. A proportion of draft blood is not objectionable in the wheelers, especially for field artillery and even horse artillery wheelers must be extra strong in the back and quarters as they have to take and hold the shock of the heavy gun in a sudden halt.

For the horse artillery as also for the lead and centre pairs of field artillery, a lighter and more breedy horse is required : thus more variation is permissible among gun horses than in those for cavalry use.

Many of our lighter general purposes horses are exceedingly well adapted for artillery work as was plainly demonstrated during the recent campaign in South Africa. The lighter types can be obtained by using a strong, stout T. B. horse on mares of size and action or by breeding biggish road mades to a good hackney or French coach horse. Many of the best gunners are bred from the T.B. horse and Suffolk mares.

The mounted infantry horse is simply a strong well-bred pony or cob with as much riding character, as possible. He should have a good rein and an oblique free shoulder should be deep through the heart, and have a strong back with a good loin and quarter. He should stand squarely on short legs not less than 14—1 nor more than 15—1. The favourite height is about 14—3.

He can be easily got by using a stout T. B. sire on French Canadian or other strong pony mares or by stinting the undersized trotting bred mares so common in Canada to a good hackney stallion, the latter being also, undoubtedly, the best horse to use in breeding from Western ponies.

Except during war, horses are bought only between 4 and 7 years old. Bays, browns and blacks are preferred, while chestnuts, especially dark chestnuts are not rejected if otherwise suitable. Blacks are especially in demand for the Household cavalry ; about fifty grey troopers and a few grey artillery horses are purchased each year for special corps, but no parti-coloured horses are wanted. Mares are purchased as well as geldings though the latter are preferred. Unsound or badly blemished horses are not taken, the veterinary examination being very strict and searching.

Un-docked horses are greatly preferred and no horse with a very short docked tail will be taken.

It is to be sincerely hoped that the negotiations now in progress will result in the establishment of permanent purchasing depots in the Dominion, for the reason that apart from any other benefits which might result, such a step would be certain to bring about a rapid improvement in the quality of the lighter horses which, whatever may be said to the contrary, will continue to be extensively bred, especially in certain localities.

The objection has been raised in certain quarters that it will not pay Canadian farmers to breed horses suitable for army purposes at the prices at which they have to be purchased by the War Office. This objection has weight, and I would not advise any Canadian farmer or horse breeder to start in with the avowed purpose of breeding horses for military purposes, but when we consider the large prices procurable for high class horses suitable for hunters', saddle horses or harness work, there can surely be no question as to the advisability of endeavouring to breed such animals in preference to the nondescripts now so strongly in evidence everywhere throughout the Dominion. Let the breeder of light horses aim to produce a type of the highest class and if he fails, as fail he will, to do so in every instance, he will still be likely to have an animal well adapted for army work and which, if matters progress as they are now doing, will find a ready market.

Again, admitting that it will not pay the farmer to deliberately breed mounted infantry ponies, I would point out that thousands of ill conditioned and mis-shapen little weeds are annually produced in all parts of the Dominion which might, very profitably be supplanted by stout, useful, symmetrical cobs, the best of which would be in keen demand at high figures, while the remainder would be well suited to supply this comparatively new military need.

J. G. RUTHERFORD,
Veterinary Director General.

REPORT OF CANADA'S PARTICIPATION IN THE CONFECTIONERS', BAKERS', AND ALLIED TRADERS' EXHIBITION, THE GROCERY AND ALLIED TRADERS' EXHIBITION, THE DAIRY EXHIBITION.

All held at the Royal Agricultural Hall, Islington, N. London, England, September and October, 1904.

These exhibitions are altogether of a trade character, each being held in the interests of its special line of business, they are annual fixtures and various competitions take place in connection with them, apart from the regular competition of exhibitors for prizes awarded in various classes.

The Managing Directors of the two first named extended an invitation to Canada, offering the necessary space free of charge, and at the same time pointing out the advantages offered for the exploitation of our food products and that to people directly interested, the invitation was accepted and instructions were issued to this branch to prepare a suitable display.

The exhibitions are competitive, but it was not deemed advisable to enter into any of the competitions this season, it being our first venture and rather of an experimental nature ; a space of 12 x 100 feet was secured in that portion of the building known as the Minor Hall and the best location therein reserved on which was erected a stand the full size of the space, over this series of arches were sprung with an overhead decoration of grains, grasses, photographs, flags and shields, making a very attractive setting which was much admired by visitors, being altogether out of the ordinary run of decoration as generally used ; many seeing it were reminded of Canada's Coronation arch at Whitehall.

The Canadian exhibit consisted of, first in the Confectioners', Bakers' and Allied Traders' Exhibition, flour of different grades, but more especially that made from hard wheat, fruits, natural, preserved in antiseptic and tinned, biscuits, confectionery, chocolates, maple creams, maple sugar, maple syrup, honey drawn and in the comb, eggs, butter, lard, baking powder, condensed milk and cream, &c.

In the Grocery and Allied Traders' Exhibition all of the above were included with the addition of tinned vegetables, meats, soups, fish, wines, whiskies, hams, bacon, cheddar, Oka, and potted cheese, various cereals, breakfast foods, buckwheat flour, starch, corn, syrup, dressed poultry, &c.

And at the Dairy Show the principal exhibits were butter, cheddar, Oka and potted cheese, hams, bacon, lard, eggs, dressed poultry, fruits and a few tinned meats.

The attendance was good throughout and consisted mainly of people interested in the exhibits, conferences were held in connection with each exhibition and excursions were run from all parts of the kingdom; at the first exhibition the inquiries were principally from bakers and manufacturing confectioners and referred mostly to flour, eggs, butter, maple products, fruits, &c., at the second exhibition, fruits tinned and in glass, wines, bacon, cereal breakfast foods, cheese and butter ; and at the third exhibition, butter and cheese mainly; many of these inquiries were from dealers in the provinces who particularly wanted addresses of agents or representatives at London, Liverpool, Glassgow, Bristol, or other ports with a view to procuring lines of Canadian products as quickly as possible, needless to say all possible information was given in each and every case. In most cases the inquiries were answered on the spot, but occasionally when some particular details were sought for of which the data was not at hand, it was subsequently forwarded, at the Dairy Show many inquiries were made

by persons contemplating removing to Canada to take up western lands, to answer these fully, a representative of the immigration office in London was in attendance.

As stated above the Canadian exhibits were not entered for competition, nevertheless many of the judges in different classes tested our products and expressed themselves as highly pleased with them and in several instances classed them as equal to the prize winners.

On the opening day of each of these exhibits a press luncheon was held, your representatives had the pleasure of attending two of these and were called upon to reply to the toast of 'Success to Canada' at one of them; in this connection we have to sincerely thank the representative of both the daily and trade press for the very cordial manner in which they received us, more especially that devoted to the trade represented at the exhibitions. All of the leading journals devoted large portions of space to describing our exhibit, Canada's enterprise, &c.

Thanks are due to the High Commissioner for Canada for the hearty manner in which he assisted in the carrying out of this work and placed every facility at the disposal of your officers so as to bring it to a successful issue.

Thanks are also due to Mr. W. A. Aylwin, managing director and his co-directors who placed themselves entirely at our disposal, granting us privileges and opportunities which were of much value, and they sincerely hope that Canada's participation in these exhibits may now be considered an annual feature.

JAMES BRODIE.
W. H. HAY.

PATENTS OF INVENTION.

RULES AND FORMS OF THE CANADIAN PATENT OFFICE, BY ORDER IN COUNCIL, DATED 23RD FEBRUARY, 1904.

1. A personal appearance of the applicant, or his representative, at the Patent Office is not required, unless specially called for by the Commissioner.

2. In all cases the applicant or depositor of any paper is responsible for the merits of his allegations, and the validity of the instruments furnished by him or his agent.

3. Correspondence may be carried on either with the applicant, or his agent, but only with one person, and will be conveyed through the Canadian mails free of charge.

4. All documents must be legibly and neatly written or printed on foolscap paper, 13 inches long and 8 wide, with an inner margin of one inch and a half wide.

5. All communications are to be addressed—'*The Commissioner of Patents, Ottawa, Canada.*' Papers forwarded to the office should be accompanied by a letter, and a separate letter should be written on every subject.

6. As regards proceedings not specially provided for in the accompanying forms, any other form being conformable to the letter and spirit of the law may be accepted, and if not conformable therewith will be returned for correction.

7. Models need only be furnished when required by the Commissioner, and must be neat and substantial working ones, not exceeding twelve inches on the longest side, unless otherwise allowed by special permission ; models must be so constructed as to show exactly every part of the invention claimed and its mode of working. In cases where samples of ingredients are required by law, they must be contained in glass bottles properly arranged ; but dangerous or explosive substances must not be sent. Both models and bottles must bear the name of the inventor, the title of the invention and date of the application ; they must be furnished to the Patent Office free of charge and in good order.

8. All fees should be transmitted with the application for any action by the office. Remittances must be in current bankable funds, bank drafts, money orders, or certified cheques payable at par at Ottawa. Money sent by mail should be in registered letters and is at the risk of the sender. Drafts, money orders and cheques should be made payable to the Commisisoner of Patents, Ottawa.

9. An applicant for an original patent, or for the re-issue of a patent, shall proceed with his application with due diligence ; and upon his failure to prosecute the same within a period of one year after the date of the acknowledgment of the filing of his application, or other subsequent official action of which notice have been duly given, the same shall be held to be abandoned, and any fees paid thereon forfeited, unless the Commissioner is satisfied that the cause of the delay was not the fault of the applicant.

In any case, however, in which it is established to the satisfaction of the Commissioner that there is unnecessary delay on the part of the applicant in the prosecution of his application, and that such delay may injure the rights of other parties, the Commissioner may require the applicant to proceed with the prosecution of his application within such period less than one year as to the Commissioner may seem reasonable ; and upon the failure of the applicant so to do, his application shall be held to be abandoned, with forfeiture of fees, as aforesaid.

Prosecution of an application, to save it from abandonment, must include such proper action as the condition of the case may require.

10. Two or more separate inventions cannot be claimed in one application, nor included in one patent. But if separate matters are represented to be so dependent on, and connected with, each other as to be necessarily taken together, to obtain the end sought for by the inventor, the Commissioner of Patents shall be the judge whether or not the pretentions of the applicant in such respect can be entertained.

11. The filing of a protest against the issuing of a patent shall not be taken in itself as sufficient reason to withhold the granting of such patent to an applicant.

12. A *Caveat* can only be filed by an inventor, and shall be composed of a specification (*and drawings*), certified on oath [Form No. 23] and the applicant may, while it is pending, lodge additional papers, provided they relate exclusively to the same invention. The person filing a *Caveat* will not be entitled to notice of any application pending at the time of filing his *Caveat*. A *Caveat* must be limited to a single invention.

The specification of a *Caveat* should be sufficiently precise to enable the Office to judge whether there is a probable interference when a subsequent application is filed.

13. Drawings in duplicate, to be attached to the duplicate specification, must be made in India or carbon ink, on sheets of tracing cloth other than Linaura or similar fabric, eight by thirteen inches, neatly executed and without colours.

Each sheet of tracing linen shall contain the following certificate at the bottom : 'Certified to be the drawings referred to in the specification hereunto annexed,' and signed by the inventor or his attorney ; place, date, and signature of two witnesses.

All drawings must be clear, sharp, well-defined, not too fine *and perfectly black.*

Lines that are pale, ashy, very fine, ragged or broken, give bad results when photo-lithographed.

Brush-shading, tinting and imitation surface graining should never be used ; and in fine-shading the result should be attained with as few lines as possible.

Section lines also should be as open in their spacing as the case will admit of, and these, as well as all right lines, in order to insure clearness, should be made with a ruling pen. The shading of convex and concave surfaces may be dispensed with when the invention is otherwise well illustrated.

Shade lines may sometimes be used with good effect, but heavy shadows where they would obscure lines or letters of reference, should be avoided.

With each application an extra full set of drawings must be supplied on double Bristol Board, 8 by 13 inches, without writing on its face, merely the usual reference letters ; no title, certificate, nor signatures ; on the back of the sheet the name of the inventor and the title of the invention must be written in pencil.

The card board drawing should be rolled on a roller for transmission to the office as folding will prevent its usefulness for photo-lithographing.

14. In the matter of a re-issue, under Section 23 of the Act, whatever is really embraced in the original application and so described or shown in the same, that it might have been embraced in the original Patent, may be ground for a re-issue. No new matter can be introduced into the specifications, nor shall the models or drawings be amended except each by the other. In the absence of model or drawing, the re-issue may contain amendments, upon satisfactory proof to the Commissioner that such amendments were part of the invention, although omittted in the original application. Separate patents may be issued for each separate and distinct part of the invention, comprehended in the original patent.

15. Information in relation to pending applications will be furnished only to applicants, or to such persons as may be duly authorized in writing by them to obtain the same.

16. The Office can not respond to inquiries as to the probability of an alleged invention being patented in advance of an application for a patent ; nor to inquiries founded on brief or imperfect descriptions, propounded with a view of ascertaining whether alleged improvements have been patented, nor unless the name of the patentee, and, as nearly as possible, the date of the Patent, be given ; nor can it act as

an expounder of the Patent Law, nor as counsellor for individuals, except as to questions within the office.

In order to avoid unnecessary explanations and useless loss of time and labour, it is particularly recommended that reference be made to the law before writing on any subject to the Patent Office.

A copy of the Rules with a particular section marked, sent to any person making an inquiry, will be deemed a respectful answer by the Office.

17. It is desirable, both in the interests of the applicant and of the public service, that the papers and drawings should be prepared by competent persons. Therefore, the applicant is advised, unless himself competent to draw up papers, in connection with the application, to employ a skilled attorney, as the value of patents is largely based upon the ability with which the specification and claims have been prepared. The Office will always decline to advise the selection of an attorney.

18. All business with this Office should be transacted in writing. The action of the Office will be based exclusively on the written record. No attention will be paid to any alleged averbal promise or understanding in relation to which there is any disagreement or doubt.

19. An assignment is to be accompanied by a copy thereof ; the original will be kept in the Patent Office, and the copy will be returned to the person sending it, with certificate of registration thereon.

20. All cases connected with the intricate and multifarious proceedings arising from the working of the Patent Office, which are not specially defined and provided for in these rules, will be decided in accordance with the merits of each case under the authority of the commissioner ; and such decision will be communicated to the interested parties in writing.

21. Applications for patents sent to this office, unaccompanied by the fee provided by law, will receive no official recognition, nor be filed nor numbered ; they will merely be pigeon-holed, and only marked filed the day on which the fee shall have been received.

22. The applicant has a right to amend before or after the first rejection or action; and he may amend as often as the examiner presents new references or reasons for rejection. In so amending, the applicant must clearly point out by letter accompanying his amendments and not therein, all the patentable novelty which he thinks the case presents in view of the state of the art disclosed by the references cited or the objections made. He must also show how the amendments avoid such references or objections.

23. The specification and drawing must be amended and revised when required, to correct inaccuracies of description or unnecessary prolixity, and to secure correspondence between the claim, the specification and the drawing. But no change in the drawing may be made except by written permission of the office.

24. Amendments must not be made by erasures or insertions in the original papers, but must be made on fresh sheets of paper, so that the sheets containing the matter to be amended may be removed from the application and replaced by sheets containing the amendments.

Amendments to the specifications must be made in duplicate, and those to the claims in triplicate.

COMPULSORY LICENSES.

25. A petition to the Commissioner for an order for a license under section 7, paragraph (a), of the Act to amend the Patent Act, 1903, shall show clearly the ground or grounds upon which the petitioner claims to be entitled to a license, and shall state in detail the circumstances of the case, the terms upon which he asks that an order may be made, the purpose of such order, and the name and address of the patentee and of any other person who is alleged in the petition to have made default.

26. The petition and an examined copy thereof shall be left at the Patent Office, accompanied by affidavits or statutory declarations in proof of the allegations contained in the petition, together with any other documentary evidence in support; and petitioner shall within ten days after the leaving of such petition deliver to the patentee and any other person who is alleged in the petition to have made default, copies of the petition and of such affidavits or statutory declarations and other documentary evidence in support.

27. The person to whom such copies are delivered by the petitioner may, within ten days after being invited to do so by the commissioner, leave at the Patent Office their oppositions to such petition, together with their affidavits or statutory declarations or other documentary evidence in support, in answer, and if they do so, shall deliver copies thereof to the petitioner within ten days, and the petitioner may within ten days from such last mentioned delivery leave at the Patent Office his affidavits or statutory declarations and other documentary evidence, in reply; and if he does so, shall deliver copies thereof to the patentee or any other person alleged in the petition to have made default within ten days, such last mentioned affidavits or statutory declarations being confined to matters strictly in reply.

28. No further evidence than as aforesaid may be left by either side at the Patent Office, except by leave or on requisition of the Commissioner, and upon such terms, if any, as he may think fit.

29. The Commissioner may at any stage of the proceedings before granting his order, give notice of the proceedings, and furnish copies thereof to any person not a party thereto who may be interested in the patent and whose rights may be affected by his order, and may allow such person to intervene in the proceedings. After such person has been allowed to intervene, he shall be governed by these rules as though the petitioner had alleged in his petition that such person was in default.

30. On completion of the evidence, or after the expiration of the time for completing the same, the commissioner, on the request of the petitioner, shall fix a time for hearing the petition, and shall give notice to the petitioner, the patentee, and all other parties to the proceedings, that it is his intention to hear the petition on a specified day, which day shall not be less than two weeks from the date when the notice is served.

31. All petitions and other documents lodged at the Patent Office shall (unless the commissioner otherwise direct), be typewritten or printed, and the parties shall furnish as many copies of the documents lodged by them as shall be required by the commissioner.

32. Parties shall be entitled to have copies of all papers lodged in respect to the petition, at their own expense. The petitioner and each of the other parties shall specify an address for service in Canada, and may be heard in person or by counsel or by a duly authorized agent.

33. The commissioner shall, if so requested, hear counsel on behalf of the Crown on the question of granting the prayer of any petition. Counsel on behalf of the Crown shall not be required to give notice of the grounds of any objection he may think fit to take or of any evidence which he may think fit to place before the commissioner.

34. Any notice required to be served or given by the rules relating to compulsory license may be served or given by posting the same to the party to be notified in a registered envelope, and documents required to be delivered may be delivered in the same way.

35. The times prescribed by these rules may be altered or enlarged by the commissioner if he thinks fit, upon such notice to parties interested and upon such terms, if any, as he may direct.

Appendix of Forms.

PETITIONS.

Form 1.

BY A SOLE INVENTOR.

To the Commissioner of Patents, Ottawa :

The petition of John Smith, of the city of Toronto, in the province of Ontario, carpenter, showeth :

That he hath invented new and useful improvements in machines for breaking stones, not known or used by others before his invention thereof, and not being in public use, or on sale, with his consent or allowance as such inventor, for more than one year previous to his application for a patent therefor, in Canada.

Your petitioner, therefore, prays that a patent may be granted to him for the said invention, as set forth in the specification in duplicate relating thereto, and, for the purposes of the Patent Act, your petitioner elects his domicile in the city of Ottawa, province of Ontario.

John Smith.

Toronto, September 1, 1887.

Form 2.

BY JOINT INVENTORS.

To the Commissioner of Patents, Ottawa :

The petition of James Thomas, blacksmith, and George Robert Major, tinsmith, both of the city of Ottawa, in the county of Carleton, in the province of Ontario, showeth :

That they have jointly invented a new and useful improvement in the art or process of separating smut from wheat, not known or used by others before their invention thereof, and not being in public use, or on sale, with their consent or allowance as such inventors, for more than one year previous to their application for a patent therefor, in Canada.

Your petitioners, therefore, pray that a patent may be granted to them jointly for the said invention, as set forth in the specification in duplicate relating thereto, and, for the purposes of the Patent Act, your petitioners elect their domicile in the city of Ottawa, province of Ontario.

James Thomas,
George Robert Major.

Ottawa September 1, 1887.

Form 3.

BY AN ADMINISTRATOR OR EXECUTOR.

To the Commissioner of Patents, Ottawa :

The petition of James Clayton, of the city of Kingston, in the province of Ontario, stonecutter, administrator of the estate (or executor of the last will and testament)

of Thomas Clayton, in his lifetime, of the said city of Kingston, deceased, millwright (as reference to the duly certified copy of letters of administration, or letters testamentary, hereto annexed will more fully appear), showeth :

That the said Thomas Clayton did invent a new and useful composition of matter for making artificial stone, not known or used by others before his invention thereof, and not being in public use or on sale, with the consent or allowance of the said Thomas Clayton as such inventor, for more than one year previous to this application for a patent therefor, in Canada.

Your petitioner, therefore, prays that a patent may be granted to him, as administrator (or executor) of the estate of the said Thomas Clayton for the said invention, as set forth in the specification in duplicate relating thereto, and, for the purposes of the Patent Act, your petitioner elects his domicile in the city of Ottawa, province of Ontario.

JAMES CLAYTON.

KINGSTON, September 1, 1887.

FORM 4.

FOR A RE-ISSUE (BY THE INVENTOR).

To the Commissioner of Patents, Ottawa :

The petition of Thomas Brown, in the city of Ottawa, in the province of Ontario, lumber manufacturer, showeth :

That your petitioner obtained a patent bearing date the twelfth day of August, A.D. 1886, for a new and useful improvement in churns.

That the petitioner is advised that the said patent is deemed defective, or inoperative, by reason of insufficient description or specification, and that the errors arose from inadvertence, accident or mistake, without any fraudulent or deceptive intention.

Your petitioner, being desirous of obtaining a new patent in accordance with the amended description and specification in duplicate, therefore prays that he may be allowed to surrender the aforesaid patent, and a new patent be granted to him, in accordance with the amended description and specification of the said invention, for the unexpired period for which the orginal patent was granted.

THOMAS BROWN.

OTTAWA, September 1, 1887.

FORM 5.

FOR A RE-ISSUE (BY THE ASSIGNEE).

To the Commissioner of Patents, Ottawa :

The petition of David Lane, of the town of Cobourg, in the county of Northumberland, province of Ontario, tanner, showeth :

That your petitioner, by assignment bearing date the 24th day of June, 1887, obtained the exclusive right to a patent granted to Thomas Tardy, of the city of Ottawa, province of Ontario, broommaker, on the 1st of July, 1885, for new and useful improvements in planing machines.

That your petitioner is advised that the said patent is deemed defective or inoperative by reason of insufficient description, or specification, and that the error arose from inadvertence, accident or mistake, without any fraudulent or deceptive intention.

Your petitioner, being desirous of obtaining a new patent in accordance with an amended description and specification in duplicate, therefore prays that he may

be allowed to surrender the aforesaid patent, and that a new patent be granted to him, as assignee of the said Thomas Tardy, in accordance with the amended description and specification of the said invention, for the unexpired period for which the original patent was granted.

DAVID LANE.

COBOURG, September 1, 1887.

The above form is to be altered to suit the case, when the re-issue is to the administrator, or executor, of a deceased inventor.

FORM 6.

SURRENDER FORM TO ACCOMPANY APPLICATION FOR RE-ISSUE.

To all to whom these presents shall come, Thomas Brown, of the city of Ottawa, in the province of Ontario, lumber manufacturer, within named, sends greetings :—

Whereas the within written patent, for an improvement in churns, is deemed defective, or inoperative, by reason of insufficient description, or specification, and the error arose from inadvertence, accident or mistake, without any fraudulent or deceptive intention, and the Commissioner of Patents accordingly, in pursuance of the statute in such respects, hath agreed to accept the surrender of the same ;

Now know ye, that the said Thomas Brown, within named, doth by these presents surrender and yield up the within written patent, granted to him for improvements in churns, and bearing date the 8th day of June, 1886.

In witness whereof the said Thomas Brown hath set his hand and affixed his seal this first day of September, A.D., 1887.

THOMAS BROWN. [L.S.]

Signed, sealed and delivered at the city of Ottawa, in the County of Carleton, in the province of Ontario, in the presence of

HENRY COCKBURN.

FORM 7.

POWER OF ATTORNEY.

To the Commissioner of Patents, Ottawa :

The undersigned, John Brown, of the town of Cornwall, in the County of Stormont, in the province of Ontario, storekeeper, hereby appoints John Smith, of the city of Ottawa, province of Ontario, his attorney, with full power of substitution and revocation, to prosecute an application for new and useful improvements in sewing machines, to make alterations and amendments therein, to sign the drawings, to receive the patent and to transact all business in the Patent Office connected therewith.

Signed at Cornwall, this 1st day of September, 1887.

JOHN BROWN.

In the presence of
JOHN SMITH.

FORM 8.

REVOCATION OF POWER OF ATTORNEY.

To the Commissioner of Patents, Ottawa :

The undersigned, John Brown, of the town of Cornwall, in the County of Stormont, in the province of Ontario, storekeeper, having on or about the 1st September, 1887, appointed John Smith of the city of Ottawa, province of Ontario, his attorney, to prosecute an application for a patent for new and useful improvements in sewing machines, hereby revokes the power of attorney then given.

Signed at Cornwall, this thirteenth day of September, 1887.

JOHN BROWN.

In the presence of
JOHN SMITH.

SPECIFICATIONS.

FORM 9.

FOR A MACHINE.

To all whom it may concern :

Be it known that I William Woodworth, of the town of Poughkeepsie, in the County of Duchess, in the State of New York, gentleman, having invented certain new and useful improvements in meat chopping machines (for which I have obtained a patent in [here name the country] No. , bearing date 189),* do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to improvements in meat-chopping machines in which vertically-reciprocating knives operate in conjunction with a rotating chopping-block ; and the objects of my improvement are, first, to provide a continuously-lubricated bearing for the block ; second, to afford facilities for the proper adjustment of the knives independently of each other in respect to the face of the block ; and, third, to reduce the friction of the reciprocating rod which carries the knives.

* NOTE.—If no foreign patent has been obtained the words in parenthesis should be omitted.

I attain these objects by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a vertical section of the entire machine ; Fig. 2, a top view of the machine as it appears after the removal of the chopping-block and knives; Fig. 3, a vertical section of a part of the machine on the line 1, 2, Fig. 2; and Fig. 4, a detailed view in perspective of the reciprocating cross-head and its knives.

Similar letters refer to similar parts throughout the several views.

The table or plate A, its legs or standards B B, and the hanger *a*, secured to the under side of the table, constitute the frame-work of the machine. In the hanger *a* turns the shaft D, carrying a fly-wheel E, a crank-pin, on the hub of which is connected by a link *b* to a pin passing through a cross-head G, and to the latter is secured a rod H, having at its upper end a cross-head I, carrying the adjustable chopping-knives *d d*, referred to hereinafter.

The cross-head G, reciprocated by the shaft D, is provided with antifriction rollers *e e*, adapted to guides *f f*, secured to the under side of the table A, so that the reciprocation of this cross-head may be accompanied with as little friction as possible.

To the under side of a wooden chopping-block J is secured an annular rib *h* adapted to and bearing in an annular groove *i* in the table A. (See Figs. 1 and 2.) This annular groove or channel is not of the same depth throughout, but communi-

cates at one or more points (two in the present instance) with the pockets or receptacles *j j*, deeper than the groove, and containing supplies of oil in contact with which the rib *h* rotates, so that the continuous lubrication of the groove and rib is assured. The rod H passes through and is guided by a central stand K, secured to the table A, and projecting through a central opening in the chopping-block without being in contact therewith, the upper portion of the said stand being contained within a cover *k*, which is secured to the block, and which prevents particles of meat from escaping through the central opening of the same.

The cross-head, I, previously referred to, and shown in perspective in Fig. 4, is vertically adjustable on the rod H, and can be retained after adjustment by a set-screw *x*, the upper end of the rod being threaded for the reception of nuts, which resist the shocks imparted to the cross-head when the knives are brought into violent contact with the meat on the chopping-block.

The knives *d d* are adjustable independently of each other and of the said cross-head, so that the coincidence of the cutting-edge of each knife with the face of the chopping-block may always be assured.

I prefer to carry out this feature of my invention in the manner shown in Fig. 4, where it will be seen that two screw-rods *m m* rise vertically from the back of each knife and pass through lugs *n n* on the cross-head, each rod being furnished with two nuts, one above and the other below the lug through which it passes. The most accurate adjustment of the knives can be effected by the manipulation of these nuts.

A circular casing *p* is secured to the chopping-block, so as to form on the same a trough P for keeping the meat within proper bounds; and on the edge of the annular rib *h*, secured to the bottom of the block, are teeth for receiving those of a pinion *q*, which may be driven by the shaft D, through the medium of any suitable system of gearing, that shown in the drawing forming no part of my present invention.

This shaft D may be driven by a belt passing round the pulleys *s*, or it may be driven by hand from a shaft W, furnished at one end with a handle *t*, and at the other with a cog-wheel R, gearing into a pinion on the said shaft D.

A platform T may be hinged, as at *w*, to one edge of the table A, to support a vessel in which the chopped meat can be deposited. The means by which it may be supported, and the most convenient method of disposing of it when not in use, are shown in Fig. 1.

I am aware that prior to my invention meat-chopping machines have been made with vertically-reciprocating knives operating in conjunction with rotating chopping blocks. I therefore do not claim such a combination broadly; but

What I do claim as my invention, and desire to secure by letters patent, is—

1. The combination, in a meat-chopping machine, of a rotary choping-block having an annular rib, with a table having an annular recess and a pocket communicating with the said recess, all substantially as set forth.

2. In a meat-chopping machine, the combination of a rotary chopping-block with a reciprocating cross-head carrying knives, each of which is vertically adjustable on the said cross-head independently of the other, substantially as described.

3. The knife *d*, having two screw-rods, *m m*, attached to its back, substantially as shown, for the purpose specified.

4. The combination, in a meat-chopping machine, of the reciprocating rod, carrying the knives, the cross-head secured to the said rod, and having anti-friction rollers, with guides, adapted to the said rollers, all substantially as set forth.

WILLIAM WOODWORTH.

POUGHKEEPSIE, September 4, 1887.

Signed in the presence of

JETHRO WOOD,
OLIVER EVANS.

NOTE.—The specification including the claims must be in duplicate, and in addition a third copy of the claims alone must be furnished.

Form 10.

FOR AN ART OR PROCESS.

To all whom it may concern :—

Be it known that we, Marion Ellsworth, of Chicago, county of Cook, and state of Illinois, gentleman, and Joseph Richard Shaw, of Indianapolis, County of Marion, and State of Indiana, gentleman, have jointly invented a certain new and useful process of Treating Sludge Oil, in order to obtain from it a resinous substance, (for which we have obtained a patent in [here name the country], No. , bearing date 189 ,* of which the following is a specification :—

In purification of hydrocarbon oils produced by the distillation of crude petroleum, asphalts, or bitumens, or by the destructive distillation of coal, resins, or bituminous shales, the oils, are agitated with 2 per cent or more of concentrated sulphuric acid (60° Baumé, 1.86 specfic gravity), in order to remove certain oils contained in the distillate which would, in course of time, absorb oxygen from the air, and cause the oil to become dark-coloured and gummy, and also to remove tarry substances and the disagreeable odour. Sulphuric acid combines chemically with these bodies and dissolves them, forming a dark-red, heavy liquid, which settles on the bottom of the agitator, and can then be readily drawn off from the purified oil. This peculiar compound of sulphuric acid and hydrocarbon oils dissolved in the excess of acid, is known as 'sludge.' At present it is purchased by superphosphate manufacturers, who mix it with a little water, which decomposes the compound of acid and oil, producing a weaker acid (about 50° Baumé) used in the manufacture of superphosphate of lime, and a dark-coloured offensive oil, which rises to the surface of the acid, and usually is thrown away, no commercial use having been found for it. This waste product is called 'sludge oil.'

The mode of practicing our invention is as follows : In our process, when the sludge has been decomposed by the addition of water, the sludge oil is drawn off, and is then purified by repeated washings with water, until the acid remaining in it is removed. For this purpose equal volumes of water and sludge oil may be used ; but the washing can be affected by a less quantity of water. The acid remaining in the oil, if any, is then neutralized with quicklime or caustic soda. The purified oil has a strong and somewhat disagreeable odour, and contains about 10 per cent of volatile oils, which are converted into a hard resin with difficulty. To remove these volatile substances, the sludge oil thus purified is introduced into a still with the addition of from 2 to 4 per cent of caustic soda and about 2 per cent of the oxides of lead or manganese, to oxidize any sulphurous body which may be in the oil and combine with it, and steam is then blown through the oil, the oil being kept hot either by a fire under the still or by the use of steam heated to the required temperature (between 212° and 450° Fahrenheit). The action of the steam is continued until no more volatile oils are removed, usually from five to ten hours. The steam is then shut off, and the contents of the still allowed to settle, when a sediment of tarry impurities and soda subsides, from which the pure oil may be drawn off. The oil is then introduced into a still or tank, and oxidized by blowing currents of air through it, the oil being kept at a moderate temperature from 200° to 300° Fahrenheit), either by a slow fire under the still, or by a steam coil in the bottom of the tank, or by heating the air by a hot-blast oven to the proper temperature before it is blown through the oil, and the action of the air is continued until complete oxidation is effected, and a sample on cooling solidifies to a more or less hard resin.

The time required to effect the oxidation varies with the working temperature and with the extent of surface of oil brought in contact with the air. We may define it as between four and twelve days. The action of the air upon the oil is stopped when

* Note.—If no foreign patent has been obtained, the words in parenthesis may be omitted.

samples on cooling, taken from the contents of the still, are found to be of the proper degree of hardness and toughness for the particular purpose to which the product is to be applied, and after letting the contents of the still settle the hot resin is drawn off from the sediment of soda and impurities.

The action of the air may be accelerated by adding other oxidizing agents—for example, about 2 per cent of the oxides of lead or manganese, or about 2 per cent of the manganates of soda and potassa to the oil. These substances act either by giving up oxygen to the oil or by their presence inducing a combination of the oxygen and the hydrocarbon.

An inferior quality of resin may be produced by treating the washed sludge oil in a still with caustic soda and litharge (5 per cent soda to 1 to 2 per cent litharge) and blowing a current of air through it at about the temperature of 350° Fahrenheit, which at the same time oxidizes the oil and removes the more volatile portions, which are distilled off until it is converted into a resin, which, on cooling, becomes hard and brittle. This process last mentioned requires from two to six days, but the resin produced is darker in colour than that made by first treating with steam and then with air at a lower temperature, as the colouring matter is not affected by steam at 400°, while air at that temperature rapidly darkens it by oxidation. Sunlight bleaches the colour of sludge oil, and, at the same time, greatly accelerates the absorption of oxygen from the air. To produce the lightest-coloured resins the sludge oil is steamed with 5 per cent of a solution of soda, 20° Baumé, at a low temperature (about 200° to 250° Fahrenheit for ten hours), to remove the more volatile portions, and then oxidized and bleached by exposing the oil, in shallow tanks covered by glass, to the action of the sunlight, the oil being kept hot and fluid by a steam coil in the bottom of the tank, and currents of air blown through it to produce the oxidation.

Inferior qualities of sludge oil, as those produced in the purification of lubricating oils, and which contain a large quantity of tarry substances, are treated as follows: The oil is charged in to a still, and caustic soda and black oxide of manganese, in the proportion of about 5 per cent of soda and 2 per cent of manganese, are added, and the charge distilled by a current of steam blown through the oil, assisted by a fire under the still, until only tar and coke remain behind. The distillation commences at about 350° Fahrenheit, and, the fire being increased, the temperature in the still gradually rises to about 800°, when only the thick pitch remains in the still.

By the use of steam under pressure the oil can be distilled with scarcely any decomposition, and the distillate, which is of a yellow light-red colour, can be converted into a superior resin by oxidizing it with a current of hot air. The resin produced by this oxidation of sludge oil is distinguished from all other known resins and resinous substances by its behaviour with different chemicals and solvents. It varies in colour from yellow to dark garnet red, according to the method of its production. It is hard, brittle, and odourless at ordinary temperatures, tasteless, insoluble, and not acted upon by water, soda, potassa, and ammonia, even when heated.

Alcohol of 95 per cent dissolves but small quantities of this resin, even when boiled with it. Petroleum-naphtha dissolves it very quickly without the aid of heat, producing a varnish. Spirits of turpentine readily dissolves the melted resin, forming a varnish. Benzole, chloroform, and bisulphide of carbon all dissolve the resin, the solution being aided by warming. Ether and a mixture of ether and alcohol, in equal parts, quite readily dissolve it, but not so readily as pure ether. Linseed oil and olive oil dissolve the melted resin. A solution of the resin in linseed oil and spirits of turpentine forms an 'oil varnish.' Concentrated sulphuric acid dissolves it completely; the resin separates again on adding water. Nitric acid attacks it violently and converts it into a brown tarry or gummy substance, having a pleasant, peculiar odour. Hydrochloric acid seems to have little or no action on it.

It is well known that it has been proposed to use sludge oil as a paint oil, but this has not been attended with practical success. We do not wish to be understood, how-

ever, as making claim, broadly, to a process for freeing sludge oil from the acid by the use of water and caustic alkalies, or by still further purifying it by subjecting it to distillation, or by blowing steam through it, for the purpose of removing impurities, all of which, it is well known, have been practiced since the discovery of the present processes of refining petroleum. Nor do we wish to be understood as laying claim in this application to the resinous substance produced by my process, as that forms the subject-matter of another application by me for letters patent.

We claim—

1. The process herein described for producing from sludge oil a resinous substance possessing the properties described, which consists in combining the oxygen of the air with the sludge oil with the aid of a moderate degree of heat.

2. The process of producing from sludge oil a substance of a resinous character, which consists in treating the sludge oil while heated to a moderate temperature, with air and with other oxiding agents, substantially as described.

3. The process of treating sludge oil in order to obtain from it a resinous substance, which consists in purifying such oil, distilling from it the volatile substances present therein, heating the residue to a temperature of from 200° to 300° Fahrenheit, and blowing air into it while it is so heated, substantially as described.

MARION ELLSWORTH,
JOSEPH R. SHAW.

CHICAGO, September 1, 1887.
Signed in the presence of
MAURICE JONES,
HENRY ELIAS.

FORM 11.

FOR A COMPOSITION OF MATTERS.

To all whom it may concern :—

Be it known that I, Ebenezer Whitney, of the city of Charleston, in the District of Charleston and State of South Carolina, gentleman, am the administrator of the estate of Benjamin Browning in his lifetime of the said city, gentleman, and that the said Benjamin Browning did invent a certain new and useful Composition of Matter to be Used for the Removal of Hair and Grease from Hides preparatory to tanning, (for which I have obtained a patent in [here name the country], No. , dated , 189) * of which the following is a specification :

The composition of the said Benjamin Browning consists of the following ingredients, combined in the proportions stated, viz.:

Water substantially pure	500	gallons.
Unslacked lime	350	pounds.
Soda-ash (sodium carbonate)	100	"
Saltpetre (nitrate of an alkali metal)	29	"
Sulphur (preferable flowers of sulphur)	10	"

These ingredients are to be thoroughly mingled by agitation.

In using the above named composition the hides should first be freed from all salt and imprities, by soaking green hides one day and dry hides eight days. The hides so cleaned are then placed in the said solution, and allowed to remain in it forty-eight hours. They should then be removed from the solution and unhaired in the usual way.

By use of the above composition the hair is speedily and thoroughly loosened, and the hides, while retaining all that portion of the substance which can be converted

* NOTE.—If no foreign patent has been obtained, the words in parenthesis may be omitted.

into leather, are at the same time entirely cleaned from grease and other substances which would prevent them from being tanned quickly.

I am aware that a composition consisting of soda-ash, water, lime, and sulphur has been used for the same purpose, and that a patent therefor was granted to C. D., July 10, 18—, No.——. I am also aware that saltpetre has been used in depilatory processes; but I am not aware that all of the ingredients of my composition have been used together.

What I claim, and desire to secure by letters patent of the Dominion of Canada, is—

1. The herein-described composition of matter, consisting of water, unslacked lime, soda-ash, saltpetre, and sulphur, substantially as described and for the purpose specified.

2. The herein-described composition of matter for depilating and preparing hides for tanning, consisting of pure water, five hundred gallons, unslacked lime three hundred and fifty pounds, soda-ash, one hundred pounds, saltpetre twenty pounds, and flowers of sulphur ten pounds, substantially as described.

EBENEZER WHITNEY,
Administrator.

CHARLESTON, September 1, 1887.

Signed in the presence of
JOHN JAMES,
HENRY SMITH

OATHS.

NOTE.—Where oaths are made out of Canada, and before a judge, the seal of the court, presided over by such judge, should be affixed, and if before a notary public, his seal should be affixed to such oaths.

When the invention has been assigned before the issue of Patent the affidavit must be made by the 'inventor,' not by the 'assignee.'

If the inventor is dead, the administrator or executor will make the affidavit that the person named as inventor was the inventor.

FORM 12.

BY SOLE INVENTOR FOR HIMSELF.

CANADA,
PROVINCE OF ONTARIO,
County of York.

I, John Smith, of the city of Toronto, in the County of York, in the Province of Ontario, carpenter, make oath and say, that I verily believe that I am the inventor of the new and useful improvements in Machines for Breaking Stone, described and claimed in the specification relating thereto, and for which I solicit a Patent by my petition, dated 1st of September, 1887. And I further say that the same has not been patented to me, or to others with my knowledge or consent, except in the following countries.* And I further say that the several allegations contained in the said petition are respectively true and correct.

JOHN SMITH,

Sworn before me, at the city of Toronto, the first day of September, 1887.

THOMAS BROWN,
J. P. for the County of York.

FORM 13.

JOINT INVENTORS.

CANADA,
PROVINCE OF ONTARIO,
County of Carleton.

We, James Thomas, of the city of Ottawa, in the County of Carleton, in the Province of Ontario, in the Dominion of Canada, blacksmith, and George Robert Major, of the same place, tinsmith, do hereby severally make oath and say :

1st. I, this deponent, James Thomas, for myself do hereby make oath and say that I verily believe that I and the said George Robert Major are the inventors of the new and useful improvement in the art or process of separating smut from wheat, described and claimed in the specification in duplciate relating thereto, for which we solicit a Patent by our petition to the Commissioner of Patents, dated first September, 1887. And I further say that the several allegations contained in the said petition are respectively true and correct.

2nd. I, this deponent, George Robert Major, for myself do hereby make oath and say, that I verily believe that I and the above named James Thomas are the inventors of the new and useful improvement in the art or process of separating smut from wheat, described and claimed in the specification in duplicate, relating thereto, for which we solicit a Patent by our petition to the Commissioner of Patents, dated first September, 1887 ; and I further say that the several allegations contained in the said petition are respectively true and correct.

JAMES THOMAS,
GEORGE ROBERT MAJOR.

Sworn before me, by the said James Thomas and George Robert Major, the first day of September, 1887, at the city of Ottawa.

JOHN SMITH,
J. P. for the County of Carleton.

* Here insert, if previously patented, the country or countries in which it has been so patented, giving the date and number of each patent. If not previously patented, erase the words " except in the following countries " and insert the words " in any country." This foot note also refers to Form 18, 19 and 20.

FORM 14.

FOR A RE-ISSUE (INVENTOR).

CANADA,
PROVINCE OF ONTARIO,
County of Carleton,

I, Thomas Brown, of the city of Ottawa, in the Province of Ontario, lumber manufacturer, make oath and say that the several allegations contained in my petition to the Commissioner of Patents, dated 1st of September, 1887, for a re-issue of the Patent granted to me on the 4th of September, 1886, for a new and useful improvement in churns, are respectively true and correct ;

That I am the sole owner of the said Patent ;

And that I am the inventor of the improvement set forth and claimed in the amended specification in duplicate relating thereto.

THOMAS BROWN.

Sworn before me, at the city of Ottawa, in the County of Carleton, in the Province of Ontario, this first day of September, 1887.

WILLIAM MILLS,
J. P. for the County of Carleton.

NOTE.—If the patent has not been exclusively assigned, the affidavit must state that the application for re-issue is made with the consent of the assignees.

NOTE.—See foot-note on preceding page.

Form 15.

FOR A RE-ISSUE (ASSIGNEE OF THE ENTIRE INTEREST).

Canada
Province of Ontario,
County of Carleton.

I, David Lane, of the town of Cobourg, in the County of Northumberland, Province of Ontario, tanner, make oath and say that the several allegations contained in my petition to the Commissioner of Patents, dated 1st September, 1887, for a re-issue of the Patent granted to Thomas Tardy, of the city of Ottawa, Province of Ontario, broom maker, for new and useful improvements in planing machines, are respectively true and correct ;

That I am the sole owner of the said Patent :

And that Thomas Tardy was the inventor of the improvements set forth and claimed in the amended specification in duplicate relating thereto.

David Lane.

Sworn before me, at the town of Cobourg, in the County of Northumberland, Province of Ontario, this first day of September, 1887.

Thomas Parsons,
J. P. for the County of Northumberland.

Form 16.

PETITION FOR CAVEAT.

To the Commissioner of Patents, Ottawa :

The undersigned, James Thompson, of New Edinburgh, in the County of Russell, in the Province of Ontario, school teacher, an intending applicant for a Patent, who has made certain new and useful improvements in locomotive engines, and has not perfected his inventon, prays that his specification may be filed as a *Caveat* in the Patent Office. (Here describe the invention as far as possible, and refer to letters in drawing, as in specification given before in Form No. 13.)

James Thompson.

Form 17.

OATH FOR CAVEAT.

Canada,
Province of Ontario,
County of Russell,

I, James Thompson, of New Edinburgh, in the County of Russell, Province of Ontario, school teacher, make oath and sav that I am the inventor of the invention described in the foregoing specification, and that the allegations contained therein are respectively true and correct.

James Thompson.

Sworn before me, at New Edinburgh, the first day of September, 1887.

Alexander Bush,
J. P. for the County of Russell.

ASSIGNMENTS.

FORM 18.

OF AN ENTIRE INTEREST (OR AN UNDIVIDED ONE-HALF INTEREST) IN AN INVENTION BEFORE THE ISSUE OF PATENT.

In consideration of the sum of ten dollars, to me paid by Solomon Lang, of the city of Montreal, I do hereby sell and assign to the said Solomon Lang all (or an undivided half of all) my right, title and interest in and to my invention for new and useful improvements in planing machines, as fully set forth and described in the specification which I have signed preparatory to obtaining a Patent; and I do hereby authorize and request the Commissioner of Patents, to issue the said patent to the said Solomon Lang (or jointly to myself and the said Solomon Lang) in accordance with this assignment.

Witness my hand and seal this first day of September, 1887, at the city of Montreal.

THOMAS LORD. [L.S.]

FORM 19.

OF AN ENTIRE INTEREST IN A PATENT.

In consideration of five hundred dollars, to me paid by Nathan Wilcox, of Keokuk, Iowa, I do hereby sell and assign to the said Nathan Wilcox, all my right, title and interest in and to the Patent of Canada, No. 23,460, for an improvement in locomotive head lights, granted to me July 30, 1878, the same to be held by and enjoyed by the said Nathan Wilcox to the full end of the term for which said Patent is granted, as fully and entirely as the same could have been held and enjoyed by me if this assignment and sale had not been made.

Witness my hand and seal this first day of September, 1887, at Keokuk, Iowa.

HORACE KIMBALL. [L.S.]

FORM 20.

DISCLAIMER.

(To be in duplicate.)

I, William Lookup, of the city of Hull, in the County of Ottawa, in the Province of Quebec, having on the 1st September, 1887, obtained a Patent for the Dominion of Canada, for new and useful improvements in wagon brakes ;

And through mistake, accident or inadvertence, without any wilful intent to defraud or mislead the public, I have made the claim in my specification too broad (or as being the inventor of a material or substantial part of the invention patented of which I was not the inventor, and to which I had no legal right) :

I, therefore, hereby disclaim the part of the claim in the specification, which is in the following words :

'I also claim the use of the lever A, in combination with crank D, as described.'

WILLIAM LOOKUP.

HULL, September 30, 1887.

Signed in duplicate in the presence of

DAVID BROWN,
FRANCIS LEMIEUX.

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